The Assistment Project

An Interactive Qualifying Project Report

submitted to the Faculty of

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

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Abstract

10th Grade MCAS Mathematics questions taken from past exams available on the MCAS website were created in the Assistments.org System and used in a study involving high school students preparing for the MCAS exam to compare the efficacy of scaffolding and hints on their learning performance. After analyzing the data, it was conclusive that learning occurred in both the hints and the scaffolding questions. However, it was inconclusive as to whether or not scaffolding questions are more conducive to learning.

Acknowledgements

We would like to acknowledge the continuous support that provided us the base needed to successfully fulfill this project. Neil Heffernan's initiative in creating the ASSISTment.org program and guidance; Cristina Heffernan in her continuous support and thorough reviews; Leena Razzaq for her design of our experiment curriculums; Darren, Abe, and all the MQP students who built while we built and continued to construct the system while it was up and running. Naturally, the entire project would have been impossible without students to learn and teachers to teach.

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Introduction

The goal of our Interdisciplinary Qualifying Project was two fold: first, to develop 10th grade Massachusetts Comprehensive Assessment System mathematics content for the ASSISTments.org Online Tutoring system, and, second, to confirm the efficacy of the usage of Scaffolding Questions in tutoring in comparison to questions using only hints to assist the students.

Taking MCAS content from past tests, we constructed individualized tutoring problems, along with several other groups, for a majority of MCAS questions starting at 1998 and continuing to present. With the assistance of our reviewing advisors, our group proposed, drafted, and finalized over hundreds of ASSISTment problems.

Online math tutoring software is readily available to students. Consequentially, a review of a few popular programs was conducted in order to compare our system to that of leading online tutoring software. This review was then followed by an in depth analysis and walkthrough of the ASSISTments.org Online Tutoring Software and scrutinized against competitors. It was found that each system had a unique approach to engaging and tutoring students; and yet, none of those reviewed provided exactly the same services, nor approach, as ASSISTments.org. ASSISTments targets the MCAS test by providing sub-questions, deemed "scaffolding questions," that guide the students in a particular procedure. Its goal is to provide students with a chance to learn how to answer the similar questions they will be faced with on the MCAS standardized test, a graduation requirement for Massachusetts high school students.

To achieve our first goal, the construction of the ASSISTment problems, we implemented a system of teams, divided by MCAS provided categories, which reviewed individual-built content as a group. The built problems were reviewed through an assiduous process of peer review and advisor review to finally be certified for use at local high schools. The problems were then grouped into curriculums to allow for their primary use as tutoring material.

In order to achieve our second goal, to confirm the value of scaffold questions when compared to hints, we designed a study that would determine whether learning took place in a statistically significant amount more given one type of tutoring method over the other. By creating experiment curriculums containing problems in hint and scaffold form and creating pre- and post-tests to each type we were able to detect whether learning took place in general and whether the learning that took place in one method over the other was statistically significant. Although our results were inconclusive on the differences between hints and scaffolding, it was concluded that learning took place overall and proposed that given a larger data set to work with conclusive differences would likely be found.

1 Background

Before going into detail about our work, we will first explain some of the tutoring systems out there that attempt to accomplish the same goals as the ASSISTments project. We also discuss in detail the ASSISTments software.

1.1 Other systems

Quantum, Study Island, and Mastering Physics are three widely used tutoring systems. Each of them has their own unique characteristics that separate them from each other. We summarize the features of these pieces of software below.

1.1.1 Quantum Virtual Software

The Quantum Tutoring software is a system that is "proven in research studies to **improve comprehension, problem solving skills and test scores by as much as 50%**"[1]. This system is aimed at improving students' understanding about a topic by having a number of different types of problems for each field. The Quantum Tutoring software is an intelligent system that adapts its questions and hints for the problems based on user input and perceived understanding.

The Quantum Virtual Software has 2 main tutors: the Chemistry tutor and the Applied Mathematics tutor. For our demonstration, we have chosen to focus on the Applied Mathematics tutor, since the mathematical topics covered are similar to the ones that appear in the Assistment system. This Applied Mathematics system can tutor students in a variety of different topics, such as measurement, ratio and proportions, percentages, scientific notation, metric units or linear equations.

If a student chooses to be tutored in the topic of Percentages, then the following screen will be displayed:

[1] "Press Release: Quantum Tutoring Software Improves Student Test Scores by Full Letter Grade" Quantum Simulations Web site.
Available from: http://www.quantumsimulations.com/news15.html

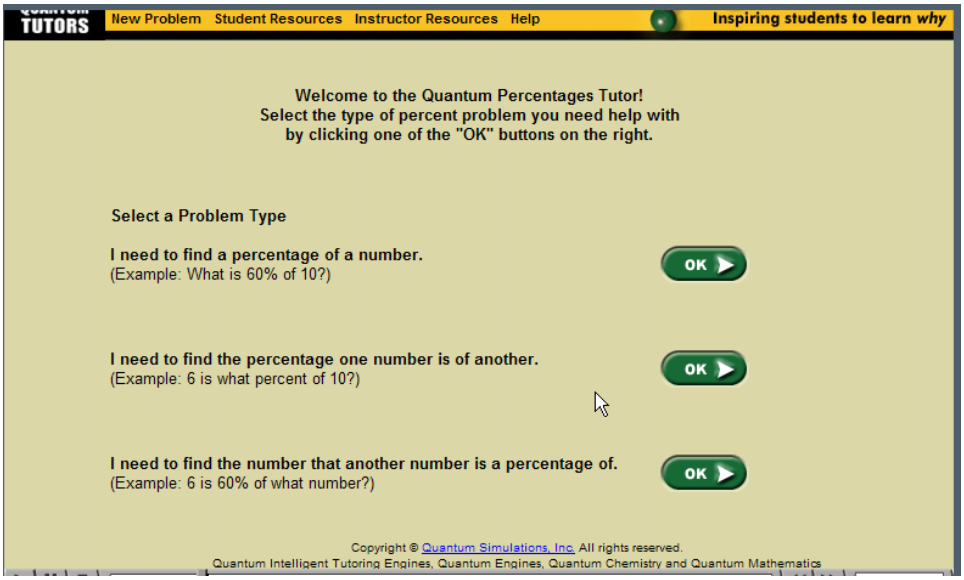


Figure 1-1 – Quantum

As we can see, the student is asked to select a problem type. This is particularly useful because this way the student can be tutored exactly in the area in which he believes he has difficulties in. After choosing a type of problem, the student has the option of either introducing his own problems or choosing randomly selected values if he/she does not have a specific problem in mind. See the figure below for a screenshot of these options.

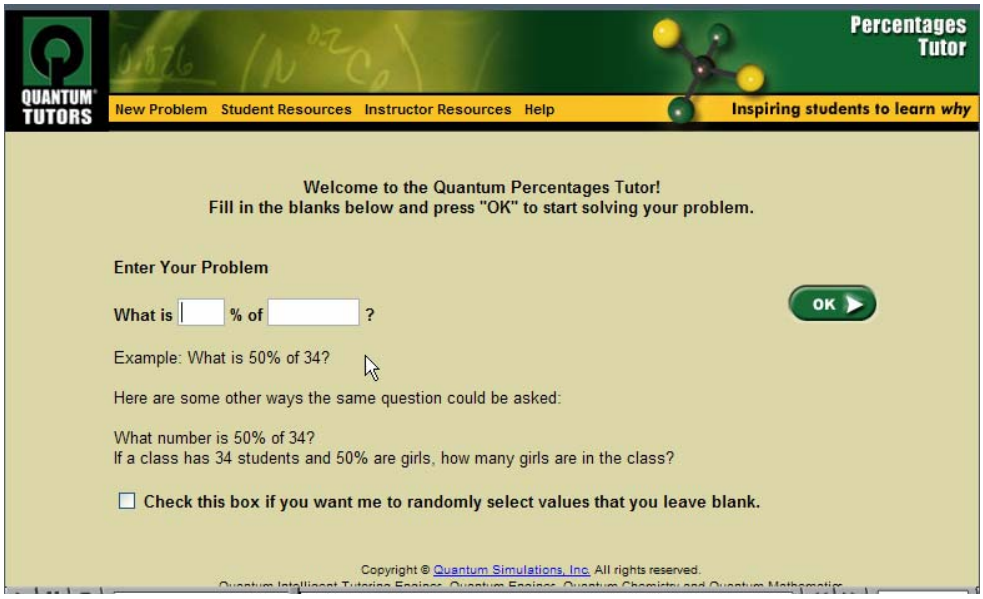


Figure 1-2 - Quantum

Let us assume that the student decides to get help on the problem “What is 20% of 80?” After inputting the numbers in the previous screen, the student is taken to the screen where he/she can enter the answer (see figure below). If the student does not know how to solve the problem, he can ask for one of the preset questions. These questions range from broad questions such as ‘What do I need to do first?’ or ‘Why are percentages important?’ to more specific questions such as ‘What would 20% be when expressed as a decimal?’ This way, both a student that does not know how to approach the problem and one that only has one specific question about the problem can benefit and maximize their learning about the system.

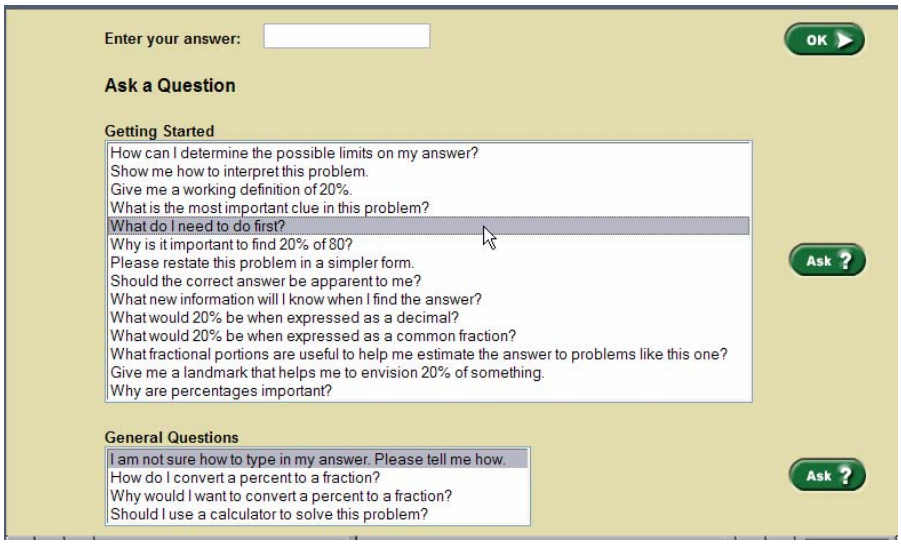


Figure 1-3 - Quantum

Let us assume that the student chooses the question 'Give me a landmark that helps me to envision 20% of something'. The hint displayed in this case gives the student an example of what 20% of another number is – this might help him/her understand how to obtain the answer to the initial problem. See the figure below for a graphical view of how the hint looks like:

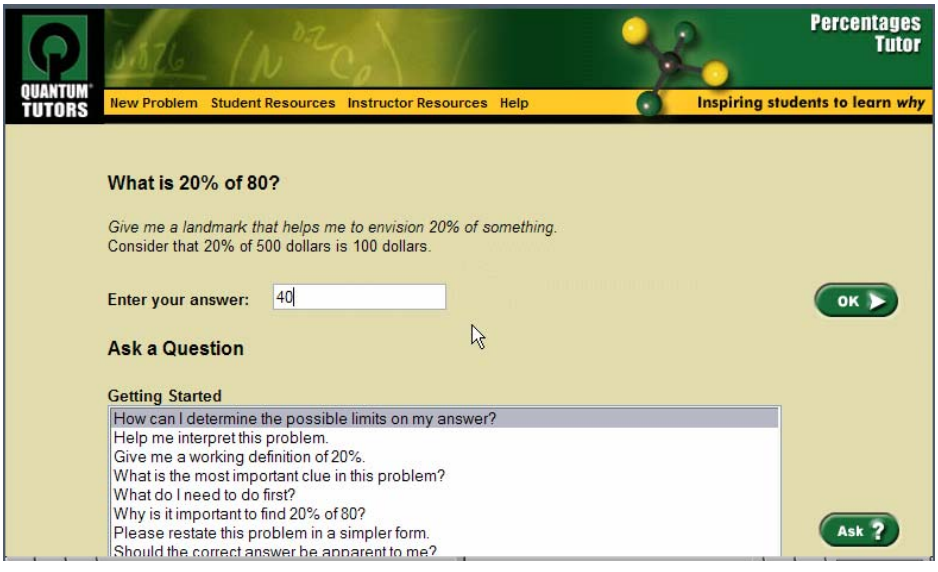


Figure 1-4 – Quantum

Let's assume that the student enters 40, a wrong answer. The intelligent system will then display a buggy message which pinpoints why the answer is wrong. In our example, the system points out that the answer given is much more than 20% and also given another hint that might lead the student in the right direction. Also, some more questions about the validity of answer can be chosen – this is particularly good because if the student manages to understand why his given answer is wrong, there is a high probability that he will be able to obtain the right answer.

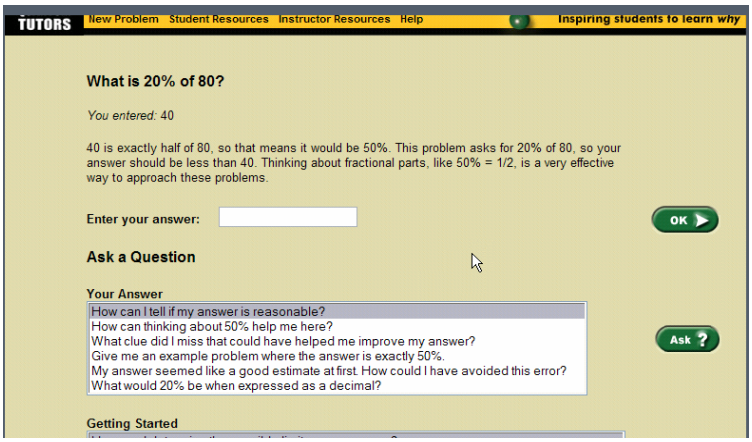


Figure 1-5 - Quantum

Overall, the Quantum Tutoring software is a very good system that seems able to help student's learning regardless of their knowledge level by alternating the difficulty of the hint choices.

1.1.2 Study Island

Study Island at a Glance

- Web-based
- Content catered to each state's set of learning standards

- Multiple-choice questions
- Program form:

  Subject Pre-Test → Material broken into topic areas → Subject Post-Test
- Dynamic problems: Changing numbers in problems, answer choices
- Brief explanation of the answer after question is completed
- Game format or traditional test format

Introduction

Study Island is a "web-based assessment, instruction, and diagnostic program designed to assist students and teachers in their effort [to] attain student mastery of the state standards."[2] Study Island is characterized by its commitment to a variety of state learning standards and its use of web-based games to promote learning.

The guiding principles and ideas behind the software are outlined in a paper produced by Study Island called "Study Island and No Child Left Behind: Solid Research Equals Solid Results." The paper attributes the software's success to three characteristics: focusing on each state's learning standards, its ease of use, and its constant regard for user feedback.[3]

Study Island creates different programs for each state based on their respective learning standards. Study Island can provide programs for many different subjects including:

[2] "Study Island and No Child Left Behind: Solid Research Equals Solid Results"
Available from: http://www10.studyisland.com/salessheets/SINCLB2006.pdf

[3] Ibid.

math, language arts, science, writing, and reading.[4] As content differs from state to state, the experience is also likely to differ. For example, some states only have content for grades 3 through 8 while other states may accommodate more or different grade levels. Figure 1-6 shows the outline of the program for 8th grade students in Massachusetts.

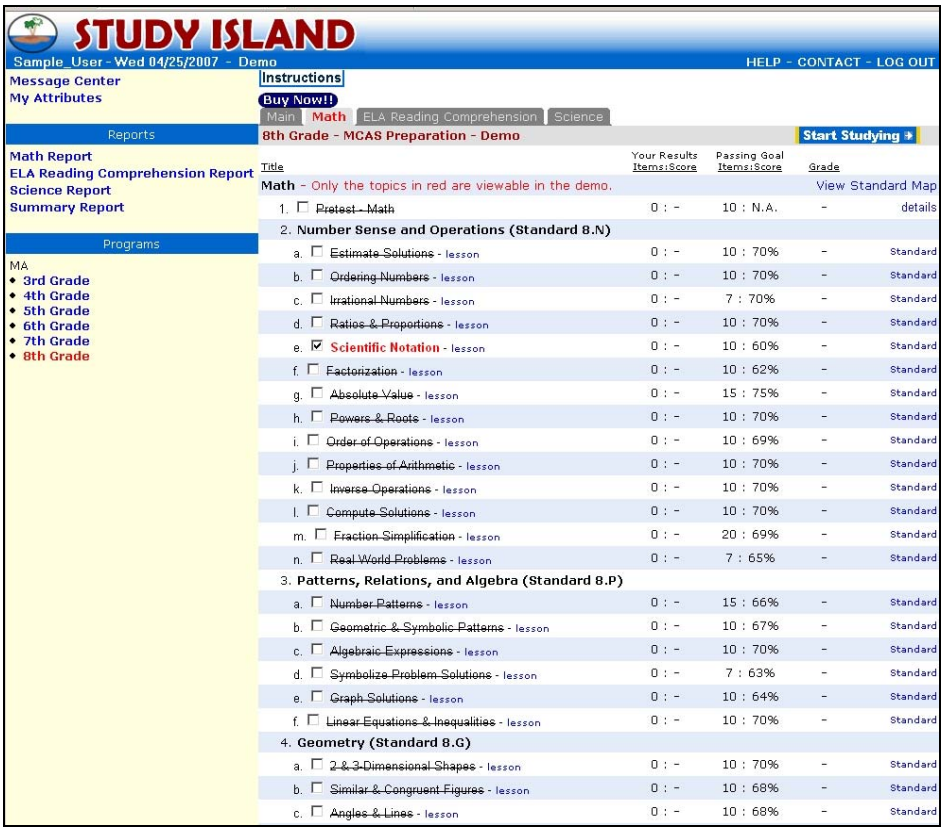


Figure 1-6 - A screenshot from a trial version of Study Island. Topics not available in the trial version are disabled.

Study Island's web-based interface makes it easy to use and maintain. With no software to install locally, the program is easier to maintain and can be used in the classroom or at home by students as long as there is an internet connection.

[4] "MCAS Preparation" Study Island Web site.
Available from: http://www.studyisland.com/demoAsk.cfm?myState=MA

Study Island relies heavily on user feedback for its continued development. The developers conduct case studies of involved schools and teachers. These take the form of questionnaires and interviews. Study Island makes these case studies as well as research papers and testimonials available on their web site.[5]

Structure

As stated before, the programs for each subject are specifically designed for a state's particular learning standards. For each subject in a state, there is a specific program. A program contains content broken up into more specific areas for that subject. Before students do any of those questions, they are expected to take a pre-test. After the pre-test and other content is completed, the students are expected to take a post-test. Students are able to complete a session for a particular topic. In a session, students complete a chosen number of questions. After students complete a question, they are given the choice to view an explanation of the answer or they can simply move on to the next question. It should be noted that questions are limited to multiple-choice answers.

Study Island utilizes some unique methods in portraying its content. One of the unique parts of Study Island is its use of games as an incentive to get kids to use it. Students can choose the more traditional "Test mode" or some of the games such as "Bowling" or "Egg hunt." Students must answer questions correctly in order to do well in the games and hopefully achieve a high score that will be displayed on the Study Island site. Figure

[5] "Document Catalog" Study Island Web site.
Available from: http://www10.studyisland.com/StateDocuments.cfm?docType=2&myState=MA

1-7 shows the “Test mode” as well as the pop-up window that gives the student the explanation at the conclusion of the problem. In contrast, Figure 1-8 shows one of the games, Ski Jump, that students are able to play.

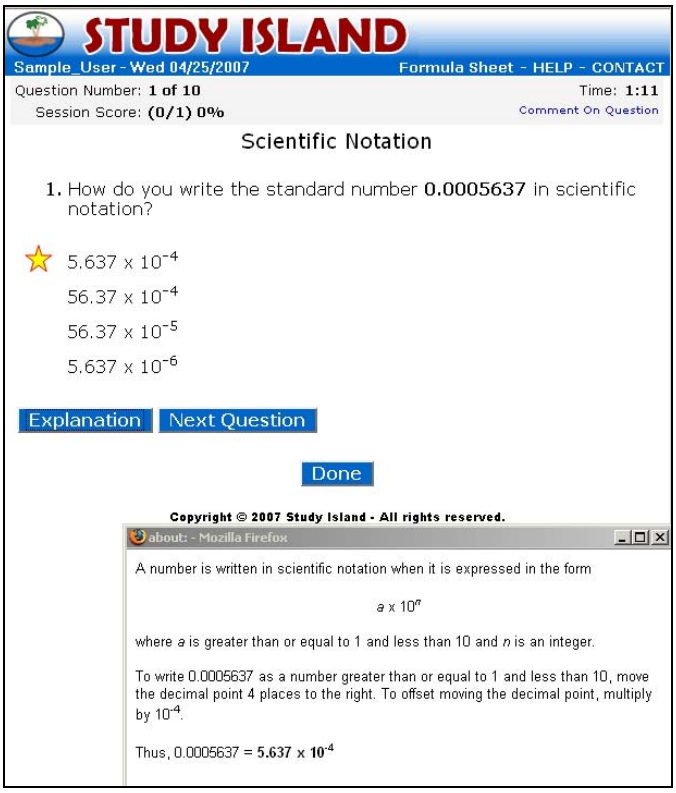


Figure 1-7 - Test Mode for Study Island. Also, a sample explanation is shown.

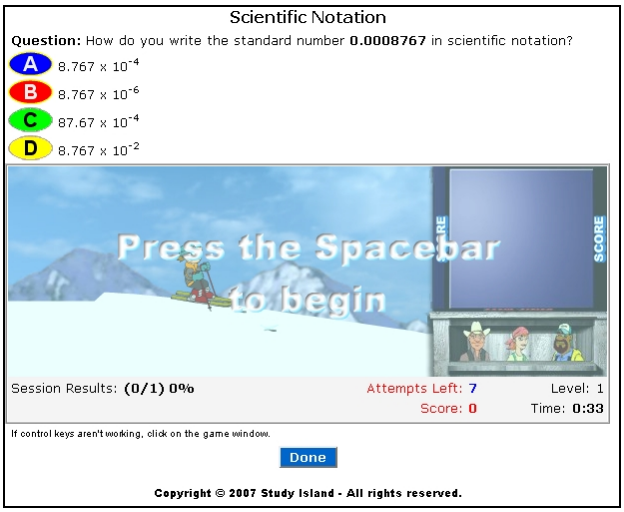


Figure 1-8 – The game Ski Jump is shown. Students must select the correct answer in order to play a portion of the game.

Study Island has the following games available to students:

- *Ski Jump*
- *Bowling Game*
- *Skate Park*
- *Cannon Game*
- *Splat Game*
- *Maze Game*
- *Snake Game*
- *Space Game*
- *Bouncing Game*
- *Egg Hunt*
- *Chase Game*

In addition to doing problems online, Study Island also allows students or teachers to print out worksheets for students to do on paper. These problems are the same problems that students would do on the online interface except that the explanations are not available. Figure 1-9 displays the worksheet that teachers or students would print out.

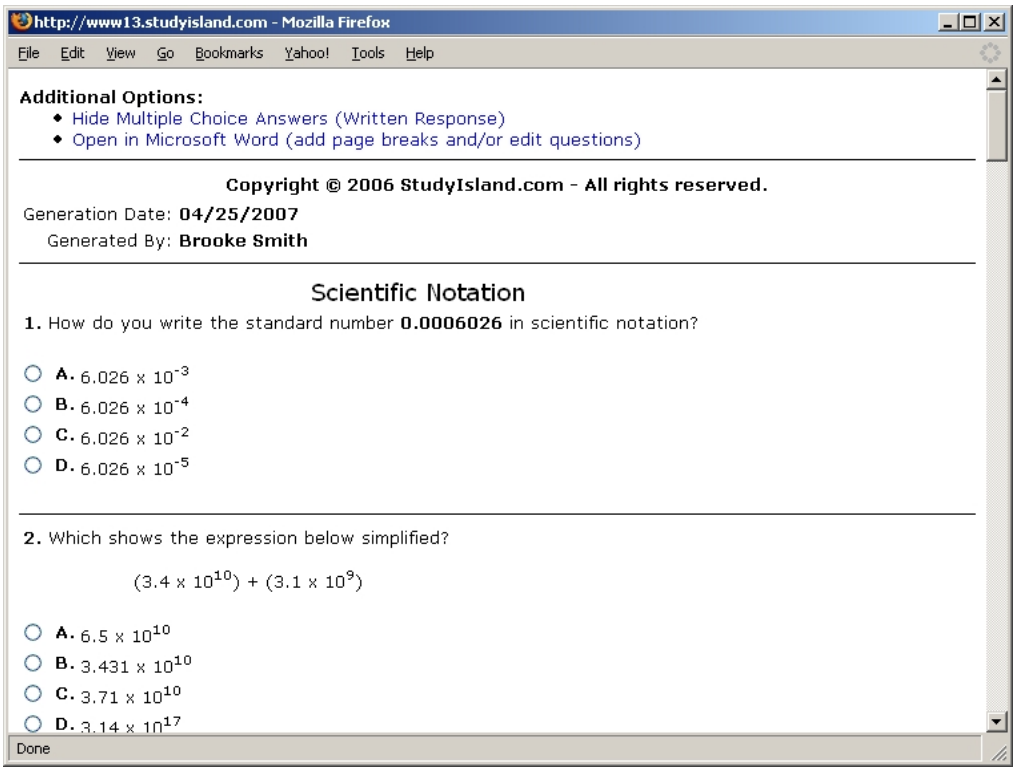


Figure 1-9 – A worksheet for Scientific Notation that was generated by Study Island

Another feature of Study Island is its use of dynamic problems. Not only is the order of multiple choice questions always changing, but the numbers in the problems also change dynamically. Study Island will also try to detect if a student is just randomly guessing. If found to be randomly guessing, Study Island will penalize the student by making them wait 10 seconds before they can select an answer. Figure 1-10 shows one of the messages that might show up if a student is thought to be guessing.

Figure 1-10 – If a student is determined to be randomly guessing, the system will display a message such as this one and force the student to wait a certain period of time before allowing them to answer.

One of the chief benefits of using Study Island as an assessment tool is its instant feedback on students. Teachers have access to the statistics for the performance of each student which can help them inform their classroom focus. As one of Study Island's guiding principles is assessment over time, monitoring a student's progress continuously is emphasized.[6]

1.1.3 Mastering Physics

Structure and Format

Mastering Physics is an online homework system that accompanies Young and Freedman's University Physics Textbook. Through the system, a teacher is able to assign to his or her students assignments consisting of one or more problems pertaining to physics.

[6] "Study Island and No Child Left Behind: Solid Research Equals Solid Results" Available from: http://www10.studyisland.com/salessheets/SINCLB2006.pdf

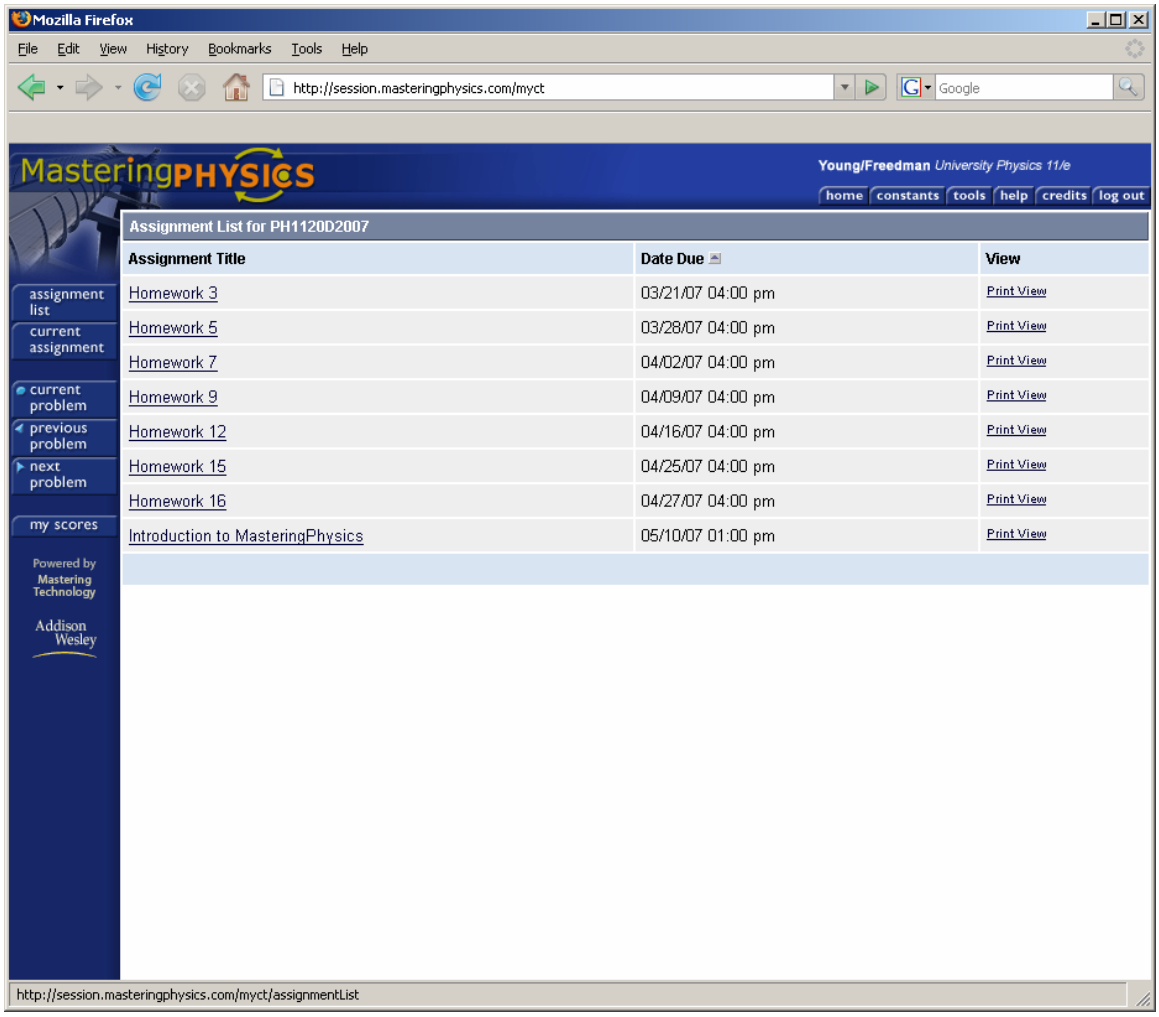


Figure 1-11 - Mastering Physics Assignment List

Problem format ranges from text entry to multiple-choice. The text entry capabilities of the system is very extensive, and algebraic expressions containing variables, square roots, trigonometric functions and more are all available. Variable expressions are filled with random values, evaluated, and then compared to the evaluated correct expression using the same values. Some problems are taken from the textbook or are slightly modified from problems in the textbook.

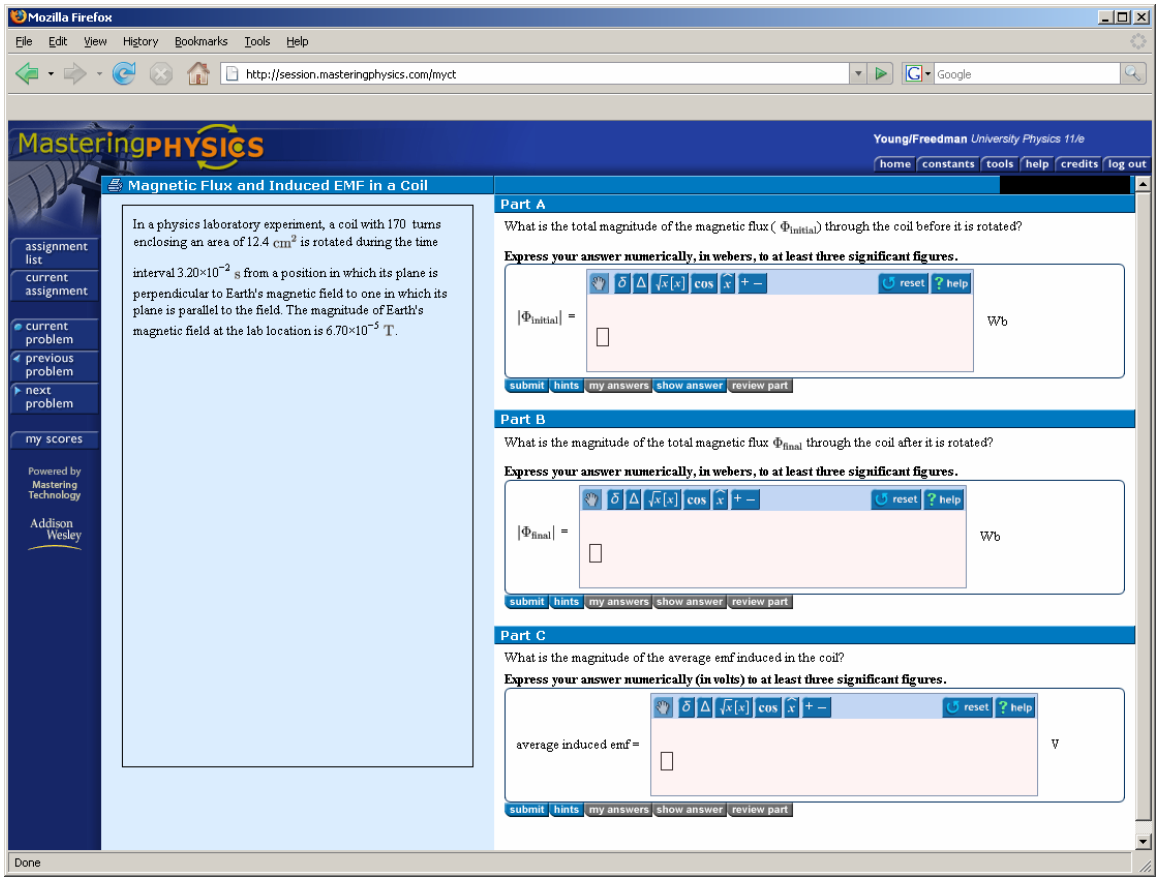


Figure 1-12 - A Mastering Physics problem

There are also problems that look specifically into a particular topic which usually come with one or more images, or even animations, and accompanying text giving some background to the problem. These more complex inquiries into a particular topic tend to have several parts which build off of previous parts of the question. These multi-part questions tend to culminate into a summarizing question that takes advantage of knowledge acquired in the previous parts of the question.

Grading

Since the system is designed for homework for university courses. The system is geared towards giving students grades for their work.

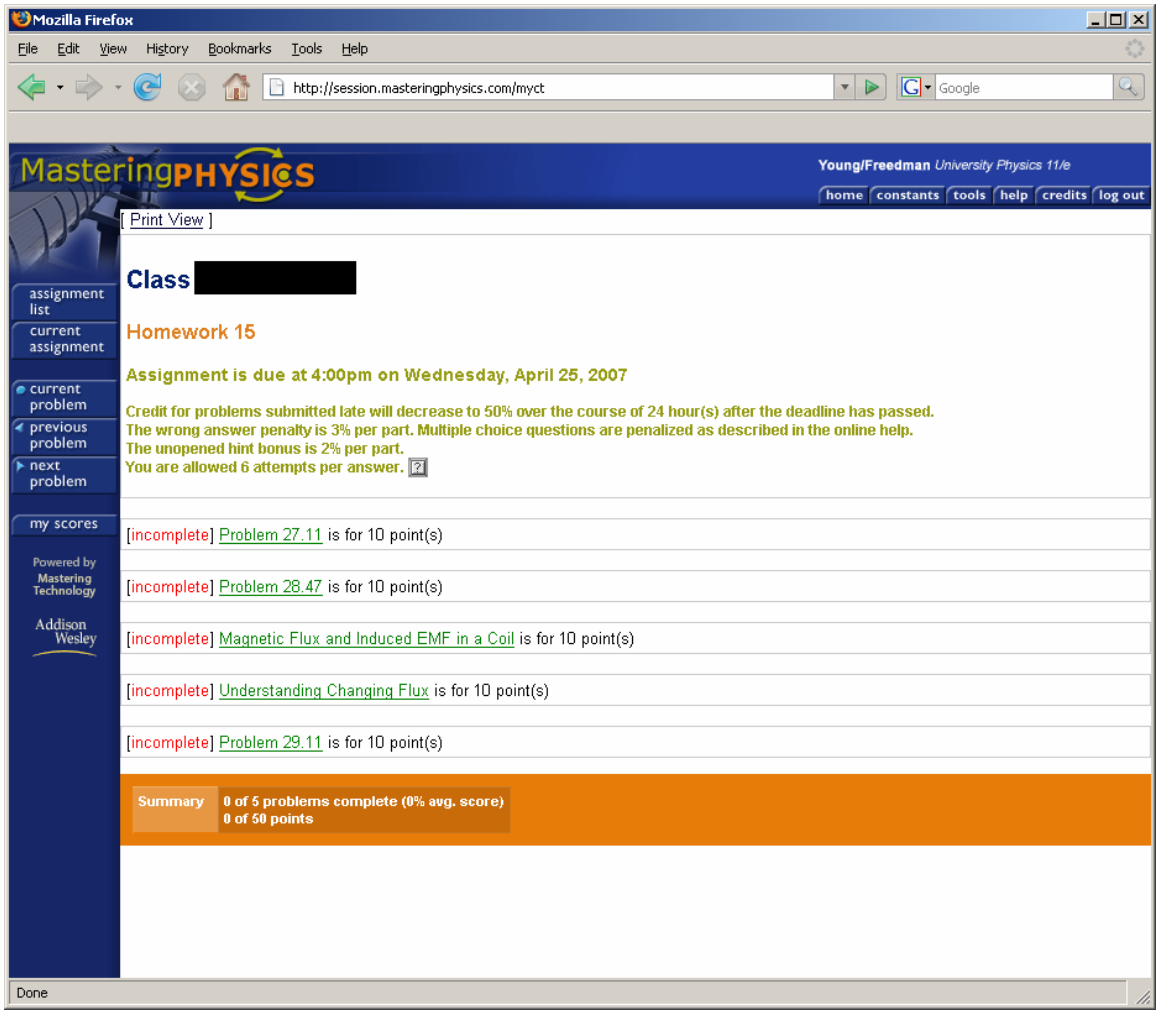


Figure 1-13 - Homework Assigned on Mastering Physics

Assignments have deadlines, and teachers can set the late penalty as they wish. Since students are allowed to make multiple attempts, the number of attempts being determined by the teacher, each attempt decreases the maximum score possible for the problem. The amount by which it is decreased is also determined by the teacher. Multiple choice questions have a heavy penalty for multiple attempts in order to keep students from guessing at the question. Also, for the problems that have hints available, students who do not use the hints receive a bonus to their score. Usage of the bonus results in a decrease of the bonus until the max score is at its base value; or lower, if the student has

made multiple attempts at the problem. If students wish, they may ask to see the correct answer at the cost of receiving no credit for the question.

Hints

Typically, complex questions with a text entry response tend to be accompanied by hints. Not all questions have hints.

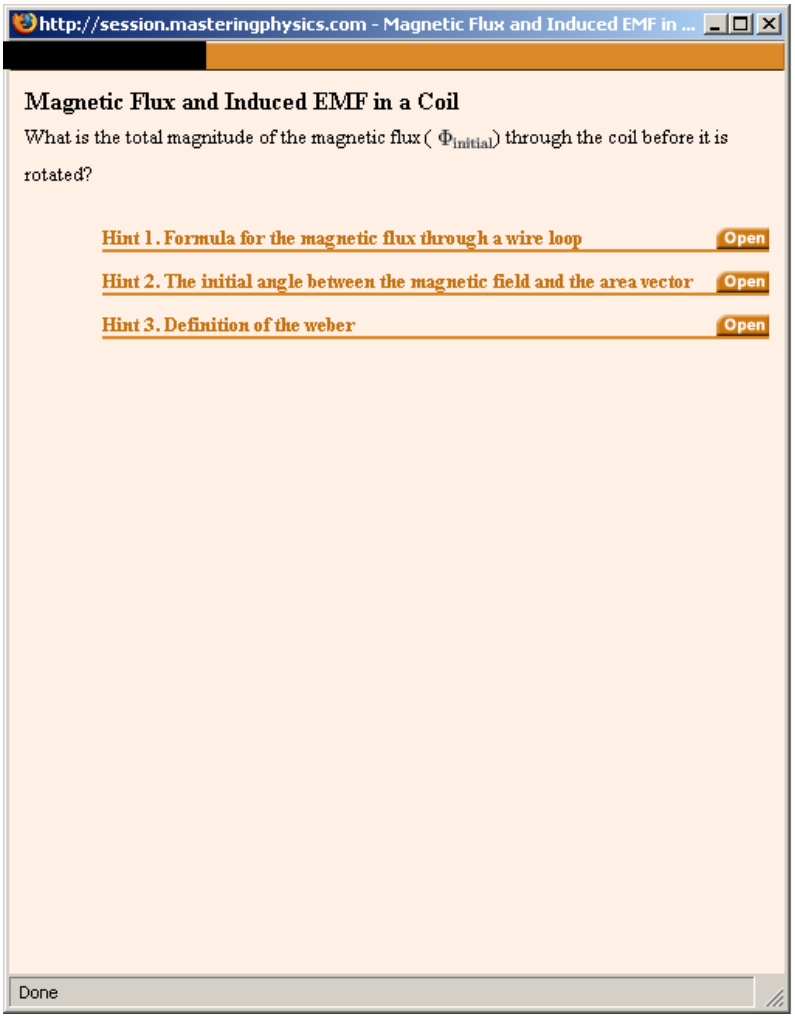


Figure 1-14 - Problem Hints on Mastering Physics

If there is a hint, students are able to see how many hints, and the title of the hint which gives them an idea of what the hint is about. While the hints are numbered sequentially,

they are allowed to open them out of sequence. This allows students to open the hint that they feel will most likely assist them in the problem. Sequentially, the hints tend to be ordered with a strategy in mind. The first hint typically will try to describe the problem in a different perspective and orient the student in the right direction by discussing key concepts needed to understand and solve the problem. The following hints inform the student of the formulas necessary to solve the problem. Finally hints that ask the students to solve a smaller part of the problem. These are similar to what we call Scaffolding Questions. There are no hints for hint questions. This can present a problem if the student is truly confused and does not know how to solve even the hint question.

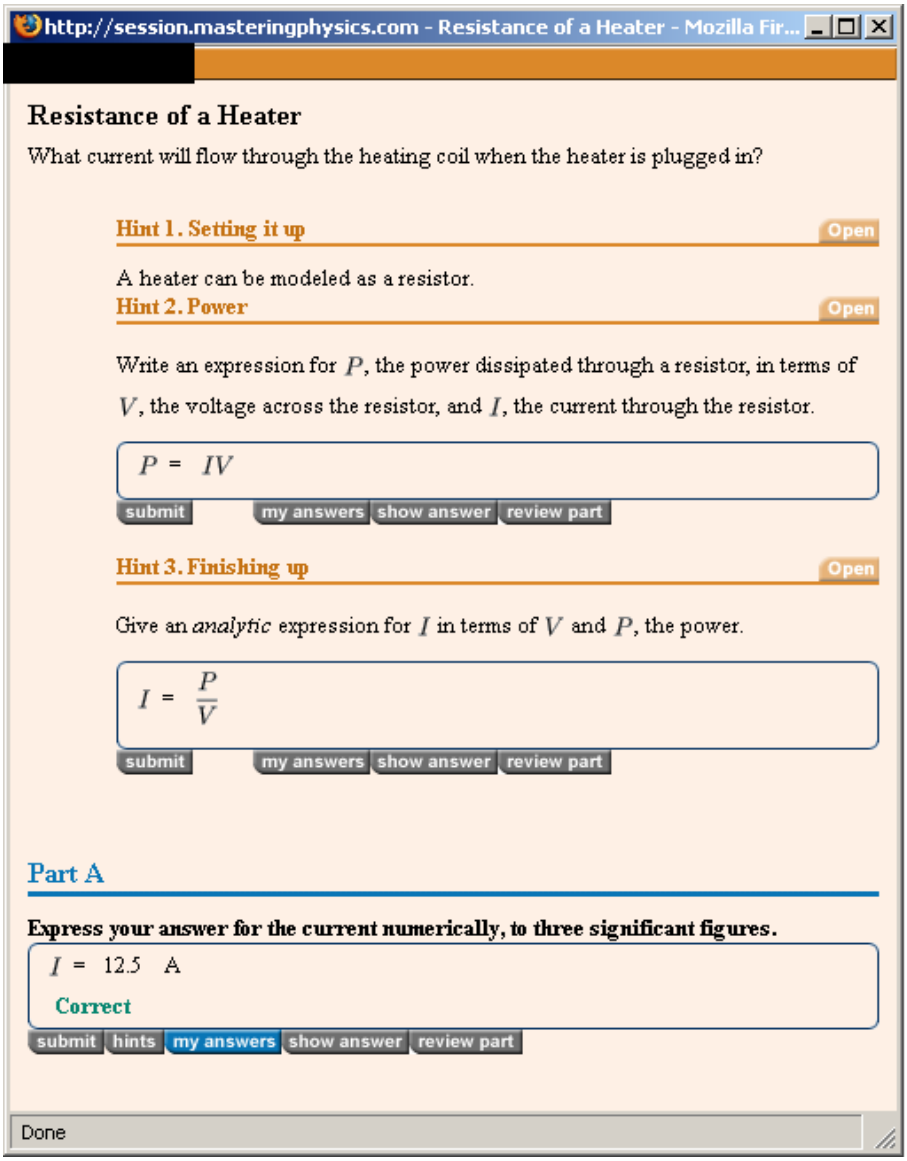


Figure 1-15 - Mastering Physics hints

Upon completion of the assignment, students may look back upon the completed problems and review their submitted answers. If the problem had hints, they are allowed to view all of the hints.

(Information potentially identifying the user of the system has been blacked out of the images)

1.2 ASSISTments

The Assistment System has several features that allow students to efficiently learn new material and teachers to get useful information about the performance of their classes. The main strength of the Assistment system is its ability to pinpoint areas of weaknesses of a group of students; this way, teachers can easily address these issues and enhance the students' understanding on the topic. This is done by introducing Knowledge Components for each of the MCAS questions and also for each individual scaffolding question. Below is an overview of the three areas of the Assistment System: the student perspective, the teacher perspective and the content builder perspective.

1.2.1 ASSISTments System

1.2.1.1 Content Builder Perspective

The Assistment system interface is specially designed to make the creation of new content easy and fast. The user-friendliness of the Assistment builder interface shortens the learning curve for creating tutoring material significantly. Here is a quick demonstration of the user-friendliness of the system for assistment building:

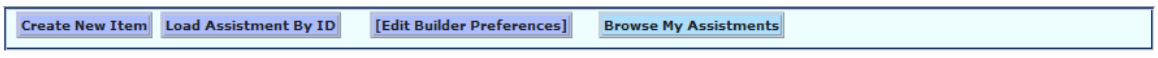


Figure 1-16 - One of the Builder's toolbars

On the top of the Assistment Builder page we see the first set of options. The four options are as follows:

1. Create New Item – This option allows the builder to create a new assistment problem. It will bring up a new page with the same layout as the initial one.
2. Load Assistment By ID – This option allows the builder to load a previously created assistment. Each assistment receives a unique ID and the assistment ID must be provided for a specific assistment to be loaded.
3. [Edit Builder Preferences] – This option allows the builder to change the settings related to the builder.
4. Browse My Assistments – This option brings up a new page that lists all the assistments previously created by that specific person.

Figure 1-17 - Another toolbar in the builder

The second set of options that is positioned right after the first list is shown in Figure 1-17. The options are as follows:

1. Save – this option allows the builder to save and name the assistment as a whole. (Note: Each part of the assistment must be saved individually before saving the assistment as a whole)
2. Save As – this option allows a previously saved assistment to be saved under a different name.

3. [Edit KCs] – this option allows the builder to edit the Knowledge Components. As mentioned before, Knowledge Components are 'tags' attached to each assistment and to each individual scaffolding question. This ensures that when a student inputs a wrong answer for a problem the exact area of weakness is pinpointed.
4. [Edit Metadata –Old] – information about the specific problem, such as the year it has appeared on the MCAS test or the status of the assistment is stored here.
5. [Preview Assistment] – this option allows the builder to preview the assistment and make sure that it works as desired. The page appears in the same window.
6. Edit Metadata – Live! – this is a shortcut to introducing or changing stored data about a content item – it opens a new window instead of going to another screen.
7. Preview –Live! –this option allows the builder to preview the assistment in a new window, which saves time as opposed to the [Preview Assistment] option.

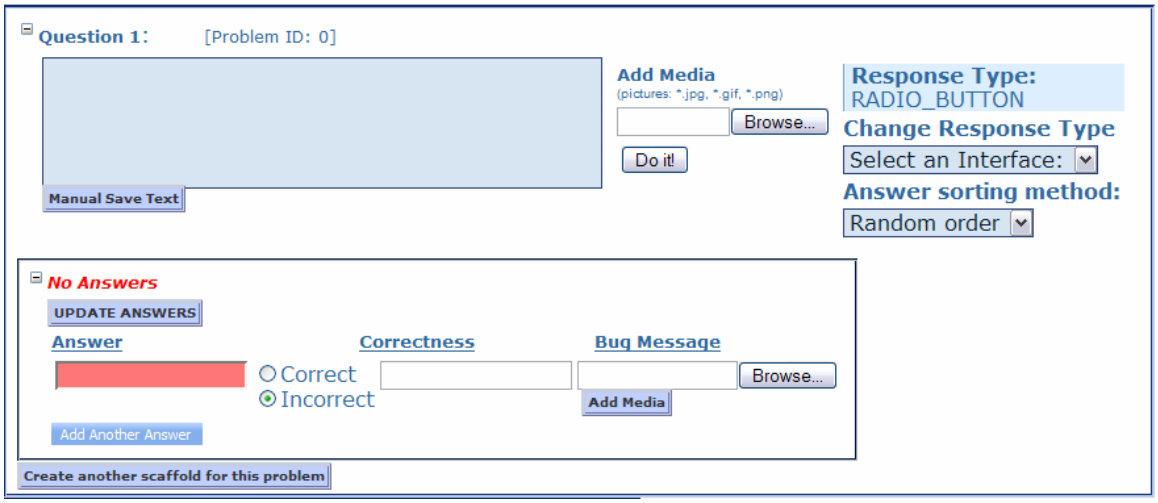


Figure 1-18 - Question and Answer form fields in the Assistment Builder

Figure 1-18 illustrates the options the builder has in order to create an assistment. A new assistment starts with the main question that needs to be answered. The text of the question can be introduced in a box manually from the keyboard and uses HTML formatting. The question is saved automatically but the builder is provided with a button to manually save the text. If the builder wants to provide an image to clarify the text of the question an “Add Media” option is provided. The builder can use the “Browse” button in order to search for the desired picture which must be saved on the computer and have the appropriate format. (i.e. *.jpg, *.gif).

The builder has several options when choosing the answer type. The options are as follows:

1. Algebra Widget – The answer has to be introduced manually in a text box. (Note: if the correct answer is 1 and the user introduces 1.0 or 1.00, the answers are going to be considered correct.
2. Radio Buttons – The builder has to provide a number of multiple choice answers and indicate which answer is incorrect and which one is correct.
3. Drop –Down Menu –The builder has to provide a series of possible answers in a list such that the user can browse them and choose the correct one. With this type of answer, the builder usually provides more options than with the “Radio Buttons” option.
4. Text Entry – The user has to manually insert his answer in a text both. The answer must match exactly the correct one.(Note: If the user introduces 1.0 and the

correct answer is 1, the answer will be considered incorrect even though mathematically 1.0 = 1)

The Answer Sorting Method drop-down bar is used when the order of the answers in a multiple-choice question is important. The default value is random, which means that each time a student sees the problem the order in which the answers appear is chosen randomly. This is an efficient way of eliminating any possible bias that the person building the assistments might have – usually builders tend to input the right answer first and then the other answers. Another option is sorting the answers numerically, which means that if the answers are numbers they are displayed in increasing order, with the smallest one being the first and the largest one the last. The last option is sorting the answers alphabetically, which means that the answers are displayed in alphabetic order.

The answers box provides the builder the option to introduce the answer(s) and possible information about them. Depending on the type of answer the builder has to indicate which answer is correct and which ones are incorrect. Also, the builder can add a buggy message to be displayed when the user chooses an answer – this might make a student understand why the answer he/she has chosen is wrong. A picture to visually aid the user as to the correctness of the answer can also be inserted.

1.2.1.2 Student Perspective

The student is the primary user of the system and most of the Assistment system is design with the student as the person who needs to gain most from it. The system is designed to

be as user-friendly and intuitive as possible so that all the students can benefit and easily navigate it, regardless of their level of computer experience.

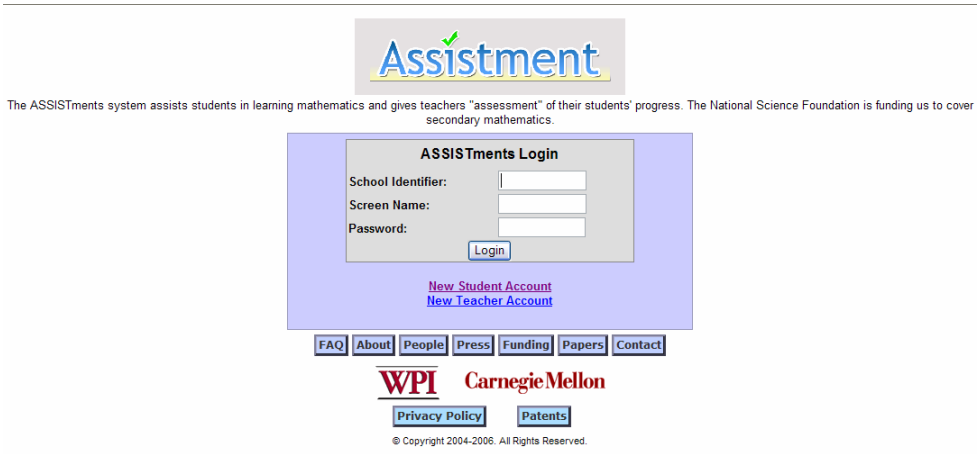


Figure 1-19 - Assistment Login

The figure above shows the main login screen. Here, the student can quickly input their username and password, or create a new student account:

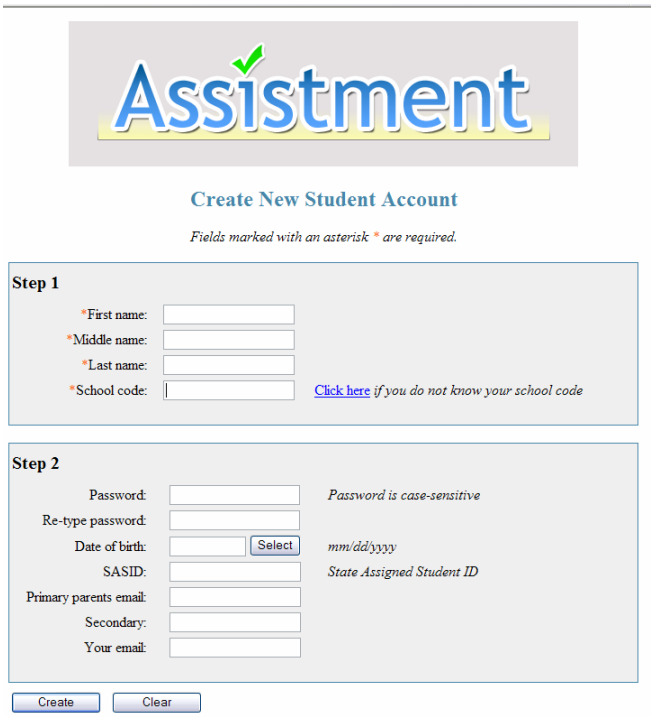


Figure 1-20 - Account creation for the Assistment web site

As we can see from the figure above, creating a new account for a student is very simple, as he only has to input the school code, and his names. The user ID will automatically be defaulted to the student's first name followed by the first initial of his/her last name and the date of birth. This is an easy way to make sure all the ID's are kept unique and it makes it easier for the student to remember it next time they log in the system.

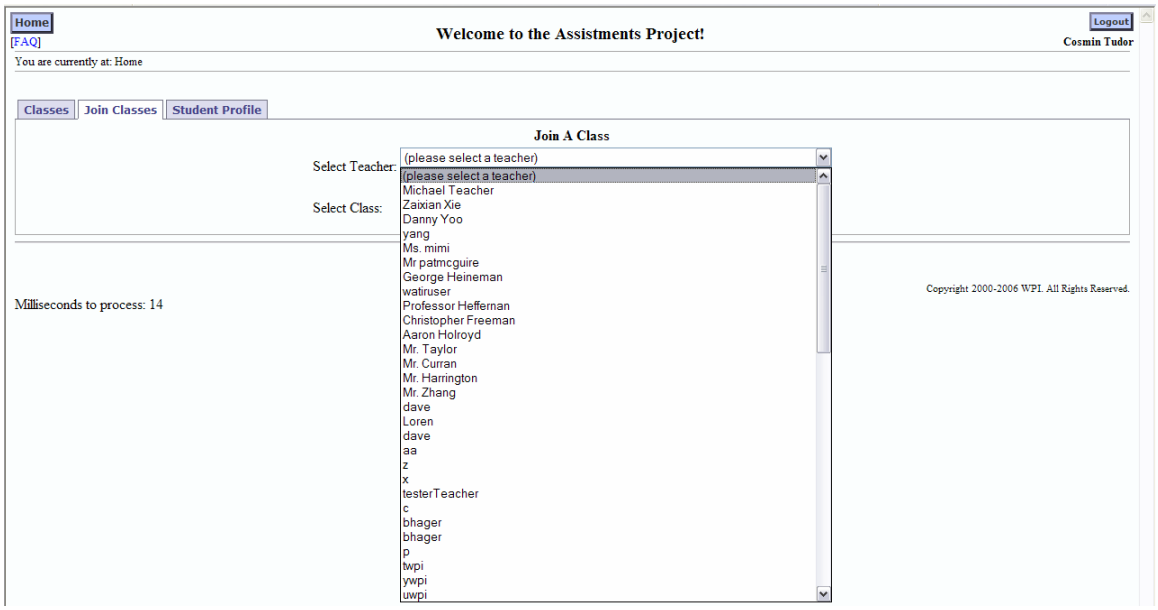


Figure 1-21 - Joining a class

After logging in, the student needs to select a class to join, as shown in the figure above. This can be easily done since the drop-down menu will contain the name of their professor. After joining the class, the students will be taken to the page where all the curriculums for his/her class are displayed. The names of the curriculums are indicative of which topic is tutored the most by the problems in that curriculum. This view is shown in the figure below.

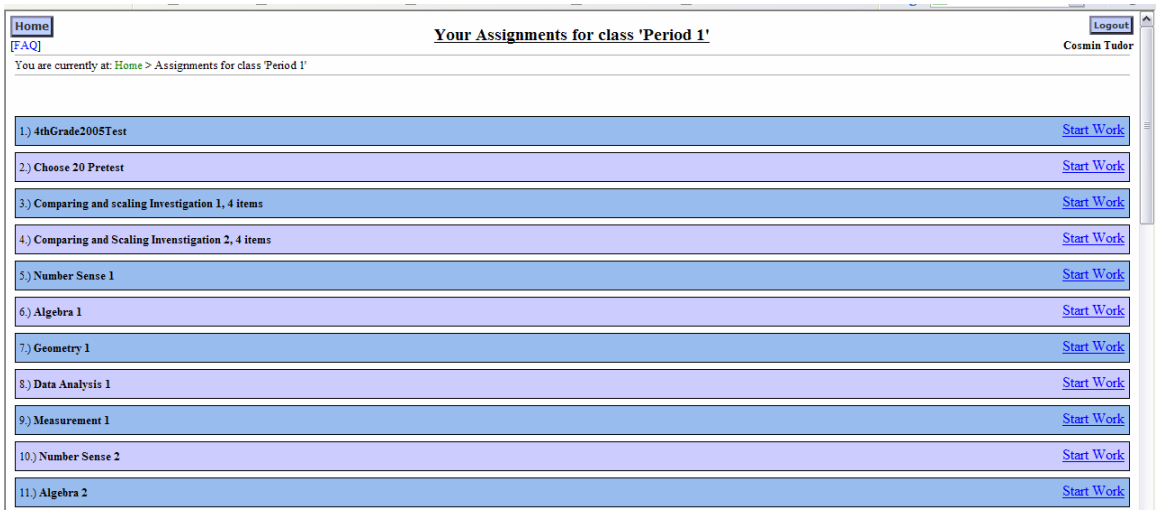


Figure 1-22 – Selecting a curriculum to do work from as a student

After choosing one of the curriculums, the student is directed to the first problem in the curriculum, as shown below. Here he can ask for hints, which takes them to scaffolding questions that will eventually take him/her to the right answer by breaking the problem down into smaller sub-problems with helpful hints and pictures. Below is an example of such a problem.

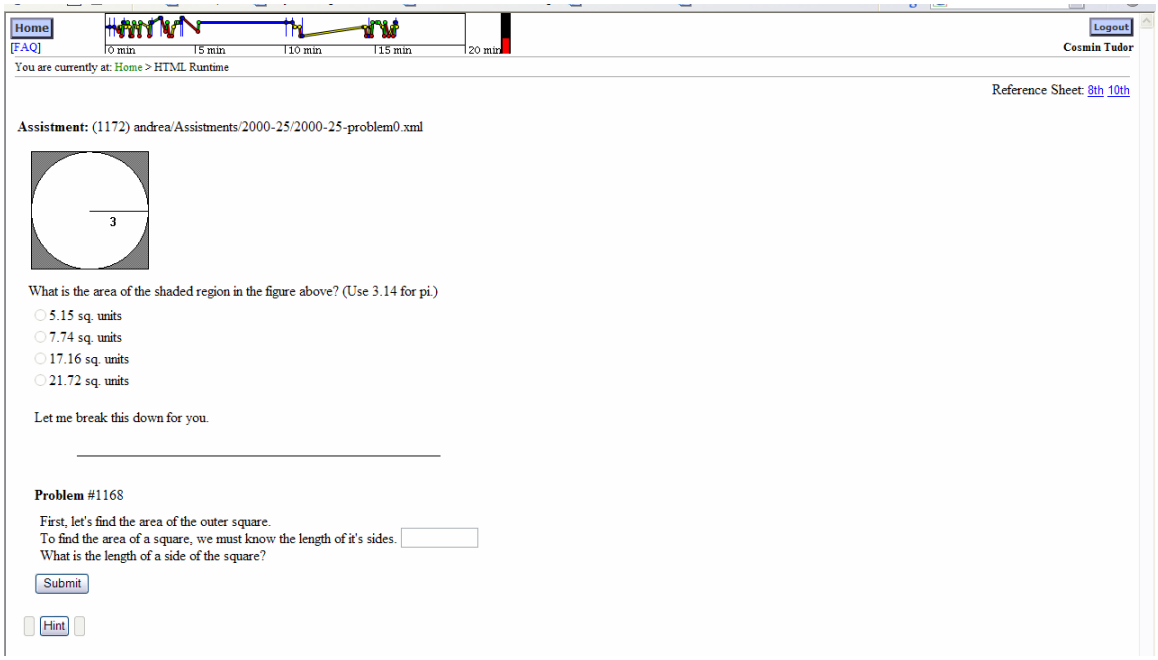


Figure 1-23 - A sample Assistment problem from the student's point of view

Teachers can get real-time live data about the children's performance by walking around the computers and looking at the progress bar at the top of the screen. This progress screen records time and uses color-coding to display events such as a wrong answer or the request for a hint. Some statistics can also be quickly shown if the mouse is placed over the progress bar. This helps the teachers quickly notice if the students are not actually attempting to solve the problems themselves but rather ask repeatedly for hints within a short period of time. The Assistment system also detects if students ask for hints in a very short period of time – if this happens a pop-up window appears encouraging them to try to think about the problem themselves before repeatedly asking for hints. Please see the figure below.

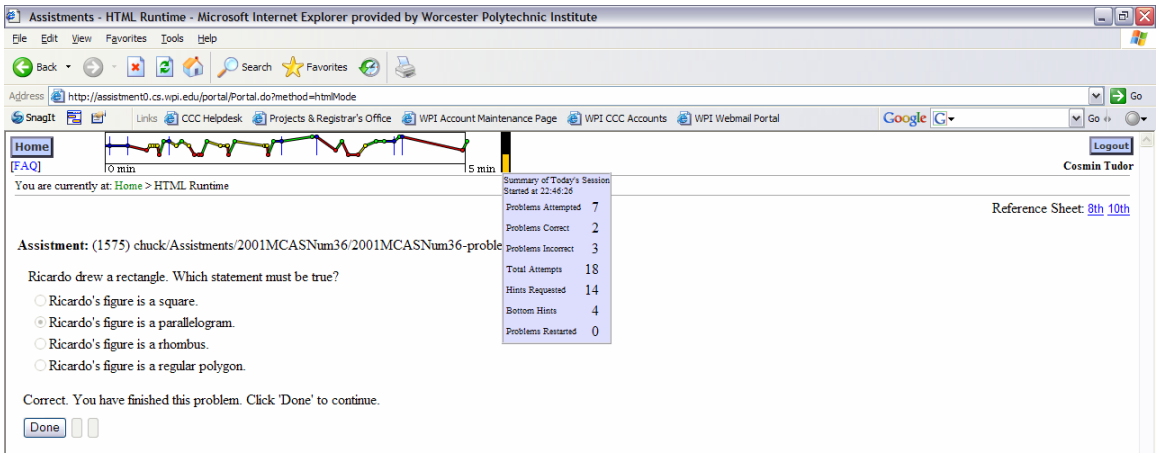


Figure 1-24 - Another look at the student's perspective

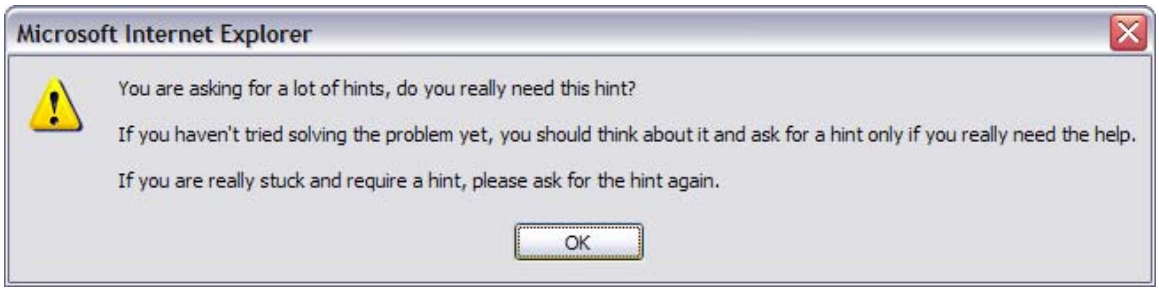


Figure 1-25 - The Assistment software notices a student who is not spending enough time thinking about the problem

1.2.1.3 Teacher Perspective

1.2.1.3.1 Class Management

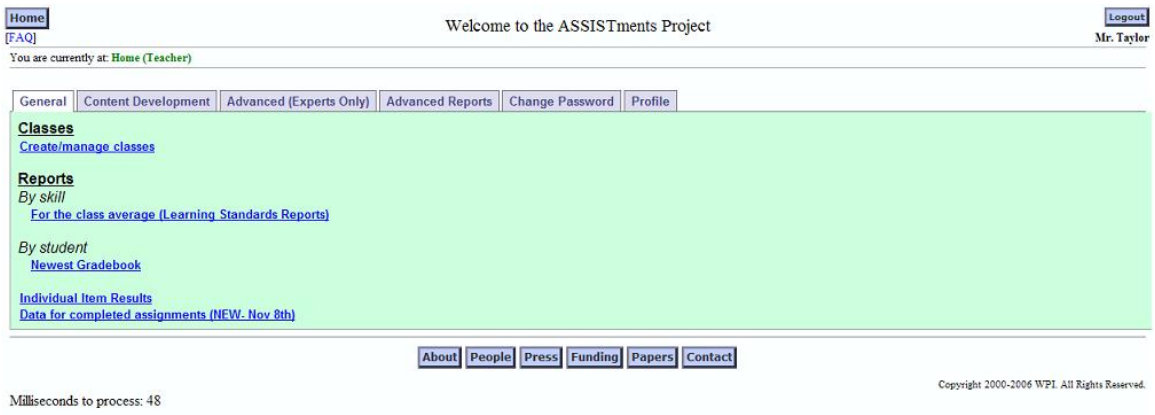


Figure 1-26 - The main screen for the teacher's view

The teacher has several features available for the tracking of student progress and the management of courses and assignments. Shown in the image above, is a link to the create and manage classes section which allows the teacher to create new classes and mange the roster of students in each class. Under the reports section, there are several options for viewing the data on student work.

Full Name	Time spent (hr:min:sec)	Original Questions					All Questions			
		# Done	# Correct	% Correct	MCAS Score	Perf. Level	# Done	# Correct	% Correct	# Hints

Figure 1-27 - Getting feedback on student progress

The most useful view is the Newest Gradebook, whose header column is shown above, which allows the teacher to view each of the students in the class, the number correct and incorrect, the number of hints the student has used, the amount of time spent on each question etc. With this kind of data, the teacher can monitor the students to ensure that they are working diligently. This data is updated live.

1.2.1.3.2 Content

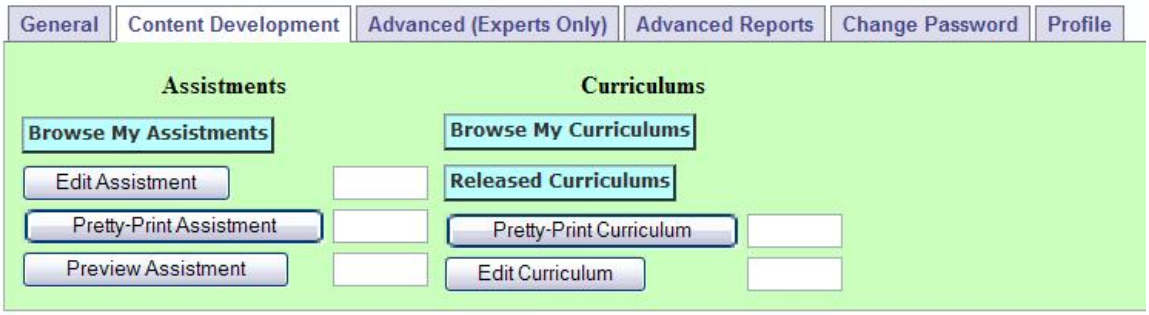


Figure 1-28 - The content development main menu

If the teacher wishes to modify, view, or test any question or curriculum, features for those are available under the content development. From here, the teacher can create new questions that cater specifically to the teacher's own needs. The teacher can also view all publicly released curriculums, and choose and use them for the class.

1.2.1.3.3 Grading and Viewing Process

Full Name	Student average	# 12470	# 12478	# 12516	# 12570	# 12589	# 12609	# 12647	# 12659	# 12790	# 12794	# 12800	# 12833
	33%	-	-	-	+	x	-	-	-	+	-	+	x
	71%	+	+	x	+	+	x	x	x	+	+	x	+
	59%	-	+	x	x	x	x	-	+	+	+	+	-
	52%	+	-	-	+	x	+	+	+	+	-	+	+
	50%	-	-	-	-	-	-	-	-	-	-	-	-
	50%	+	-	-	x	-	x	x	-	-	-	x	x
	55%	x	-	x	+	+	x	x	+	-	+	+	-
	67%	+	-	-	+	+	x	-	+	+	-	+	-

Figure 1-29 - The Gradebook

Figure 1-29 shows a different view of information that shows each students performance on each question. Each of the numbers at the top is the ID number of a question. Along the vertical axis of the table, each student is listed. The student's average is shown as well. A + represents a correct answer, and a X represents an incorrect answer. If the student has not done the problem, a – is shown. Using this view, a teacher can quickly identify which of the questions was particularly challenging to the students, and design a curriculum to supplement their understanding of that topic.

1.2.2 Comparison of Systems

By looking at the other systems, we are able to conclude that the Assistment system offers a user-friendly and pleasant environment which facilitates student tutoring and learning. Here are some areas where the Assistment system is particularly strong when compared to the other tutoring systems described above:

- **Many problems split up into various topics**– assuming that a professor is wishes to test or tutor the students in a certain area of a specific topic, he/she will have many problems at his disposal on that particular topic. The Assistment does a much better job at this than the other software considered at this, having many more problems to choose from in the predetermined areas.
- **Real problems from old MCAS tests - i**n addition to being tutored and learning various topics, all the problems have previously appears on the MCAS test, which helps the students get experience with the test questions.

- **Knowledge Components –** Knowledge Components are ‘tags’ attached to each assistment and to each individual scaffolding question. This ensures that a teacher can exactly pinpoint the exact area of weakness of his class by looking at the knowledge components of the problems that the majority of the class had trouble with. This way, the teacher can focus his/her teaching on these topics

There are also some features for the other systems which could be useful additions for the Assistment system:

- **Create your own problem** – other software allows the user to get hints on how to solve any problem they wish from a predetermined list of topics. This is a very interesting feature, since it expands the target market for the system considerable. The Assistment system is only geared at those users that desire to get experience with former MCAS problems and learn the thinking process on how to solve these problems. On the other hand, having such a feature would involve targeting a much wider market niche by putting restrictions only on certain areas of problems that the users can choose.
- **Tutorial with assisting voice**– a tutorial video on how to use the assistment system could be useful. During the tutorial, at all stages of the problem, there should be a voice that aids the user better understand the way the system

should be used. This is particularly useful, since it allows the user to become more comfortable with the system.

- **Choice of hint types** –one feature the Assistment system should implement is allowing the user to choose what kind of hint to be displayed; this is dependent on what aspect of the problem the user feel uncomfortable with. This might a useful feature, since a pre-determined hint sequence might not target exactly those areas that the user has uncertainties in and might sometimes go over material that the user already understands.
- **Interactive student answering system** – one feature of the Study Island tutoring system was having an interactive answering system, where students would choose and answer by playing a game. This would be a good addition since it might improve the popularity of the system within the students. However, there is the possibility that such an approach would make many students lose their focus and not concentrate on solving the problems.

2 Project Goals

We had two primary objectives in conducting this project and subsequent study. The first objective was to outline and build content for the ASSISTments program from the Massachusetts Comprehensive Assessment System (MCAS) in Mathematics for future student use. The second objective was to conduct a study with the constructed tutoring

problems and compare the learning with Neil Heffernan's scaffolding questions to the more standard tutoring method, the hint.

2.1 The MCAS Test

In order to explain the first goal, a brief explanation of the MCAS test is necessary. The MCAS test is a standardized examination conducted by the Commonwealth of Massachusetts which employs a series of tests in English, Math, various Sciences, and history for students in grades three, four, five, six, seven, eight, and ten. It is performed in order to compare students' progress and schools competency. It is also used as a graduation requirement for high school students. The ASSISTments program which we used to build our content is currently used solely for the math portions and our particular focus was 10^{th} grade students.

Within the 10^{th} grade math content there are five subcategories we used as means of dividing up workload and keeping track of progress. The subcategories are as follows: Geometry, Measurement, Data Analysis/Statistics/Probability, Number Sense/Operations, and Patterns/Relations/Algebra. Each test has approximately 40 questions, with each category sharing a varying proportion of that 40.

Geometry problems deal primarily with properties of geometric figures (circles, triangles, quadrilaterals, etc) (See Appendix: Knowledge Components section for full list). The

Measurement section consisted of areas, perimeters, and circumference calculations. As a matter of convenience and similarity we used Geometry and Measurement as a single grouping. The content of each category can be seen in the Knowledge Component list in the Appendix.

This categorized content is used by Massachusetts to assess students in individual areas, which conveniently allowed us to create content that is already categorized.

2.2 Building Goals

To fulfill the first goal of creating content in the ASSISTments program we employed past MCAS tests as readymade problems for our use. We used problems provided from years 1998-Present that are posted on the Massachusetts Department of Education website. Problems were taken generally verbatim unless difficulties in presentation or input methods required slight adjustment. Rarely, problems were thrown out due to their generally incompatible nature with the ASSISTments builder or the inefficiency of building them. The procedure used in building the ASSISTments will be described in a subsequent section. Our initial goal was to produce 10 problems per a week over the course of two seven-week terms, producing approximately 140 problems each. This goal was adjusted later to merely finishing off the 10^{th} grade content provided.

2.3 Study Goals

The second goal, to study the difference between standard hints and sub-questions (or "scaffolding" questions), was undertaken in order to confirm the efficacy of our general

use of scaffolding questions in the ASSISTments program. In brief, the study consisted of first creating hint versions of the problems created. By doing so we were able to compare the effectiveness and learning generated by the two different methods. The production and conduction of the study will also be described in a subsequent section.

3 Content

3.1.1 Organization

For Mathematics, the Massachusetts state learning standards and the MCAS test break down the topics into five categories:

- Geometry
- Measurement
- Number Sense and Operations
- Data, Statistics, and Probability
- Patterns, Relations, and Algebra

As the Assistment project group was large for this year, we broke into smaller teams of 3 to 4 with each team focusing on one category at a time. One team worked on Algebra, one team worked on Number Sense, and another on Geometry. The Geometry team later worked on Measurement as well. The Data, Statistics, and Probability category was worked on later on in an ad hoc fashion.

The smaller teams were useful for various reasons. One of the practical reasons was that scheduling large groups to meet at the same time was difficult. Meeting as smaller groups was much better for people's schedules. Groups met twice per week. Once per week, groups met by themselves to coordinate their work. The other meeting was for meeting with our advisor or our teacher expert to go over logistics and our work.

A good reason for these smaller teams was specialization. Team members were able to focus on similar problems and as a result become more proficient when encountering similar problems later on in the project. As members of the team became more proficient, they more readily knew how to approach a problem more correctly. In addition, content is some times reusable. Some problems recur almost identically on the MCAS and it is sometimes possible to reuse previous graphics or scaffold question formats.

Not only was the increase of a team member's proficiency in a specialized area useful, but the exchange of ideas, technical help, and resources between team members was also key for efficiency and productivity. There was also cross-team communication for information that was helpful for all groups.

To help us stay organized, we each maintained binders with our work materials. We maintained separate sections: drafted content, built content, and finished content. We had printed copies of all of our work in each stage of its design. This was helpful for the editing process. Comments and edits were written direct to our copies.

3.1.2 Design Process

3.1.2.1 Drafts

As we began the project, it was important for us to become adept at writing tutoring content. Since using the builder software can be time consuming, our work was drafted in a Microsoft Word document using a design template given to us by our advisor. Figure 3-1 shows this template. This allowed us to have our work critiqued well before we put too much effort into a problem that we have approached incorrectly. Secondly, we took advantage of the spell checking feature of Microsoft Word and later just copy and pasted our text into the builder.

In these drafts, we planned out our scaffolding questions and hints. We inserted any pictures that we have already made. Figure 3-2 shows the template filled out with an MCAS Geometry problem. After printing out the draft, we also drew sketches of pictures that we thought should be included. The printed drafts were useful for stimulating dialogue about the approach to the problem. After a draft was approved, work could begin with the Assistment Builder.

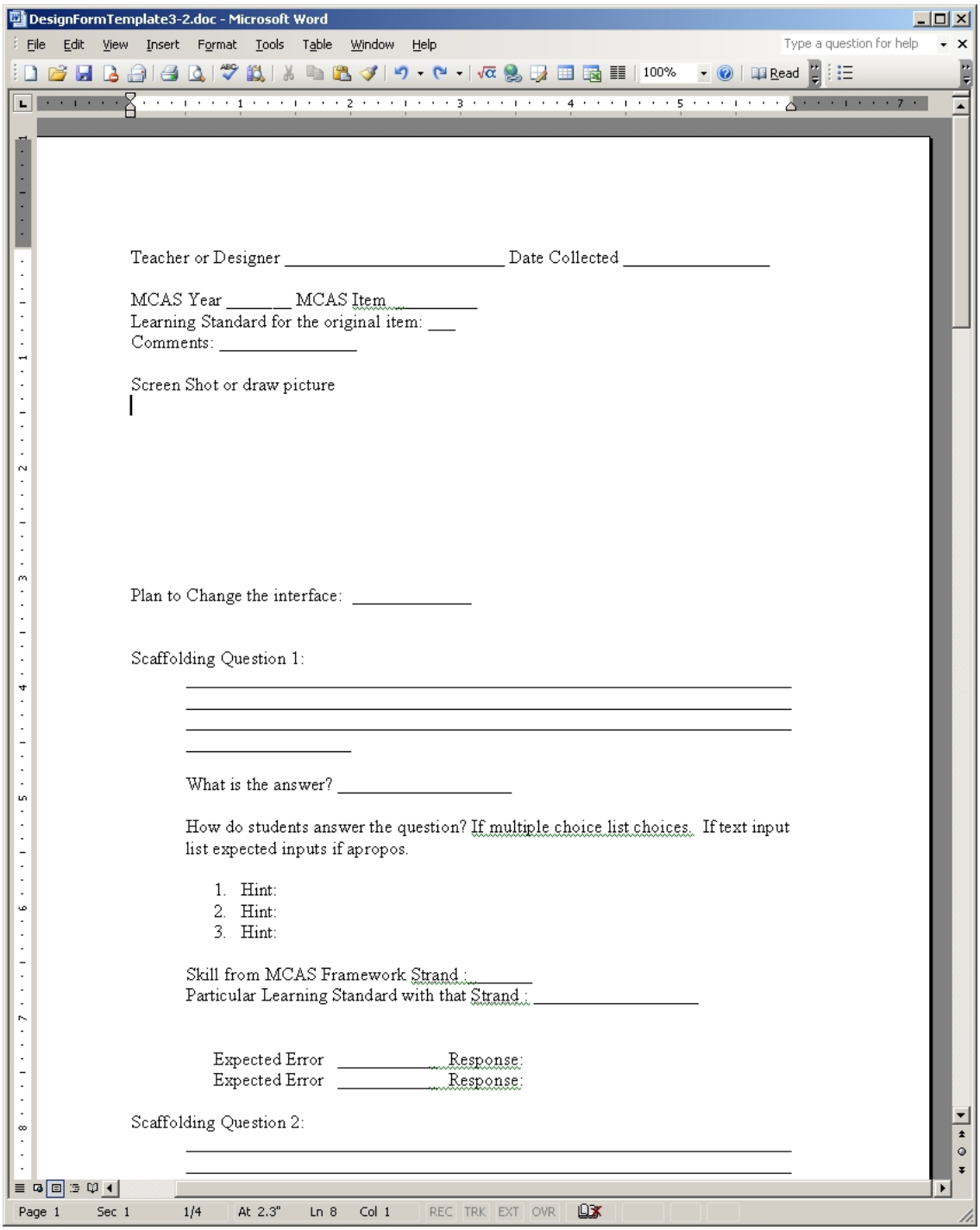


Figure 3-1 - The Design Template in Microsoft Word

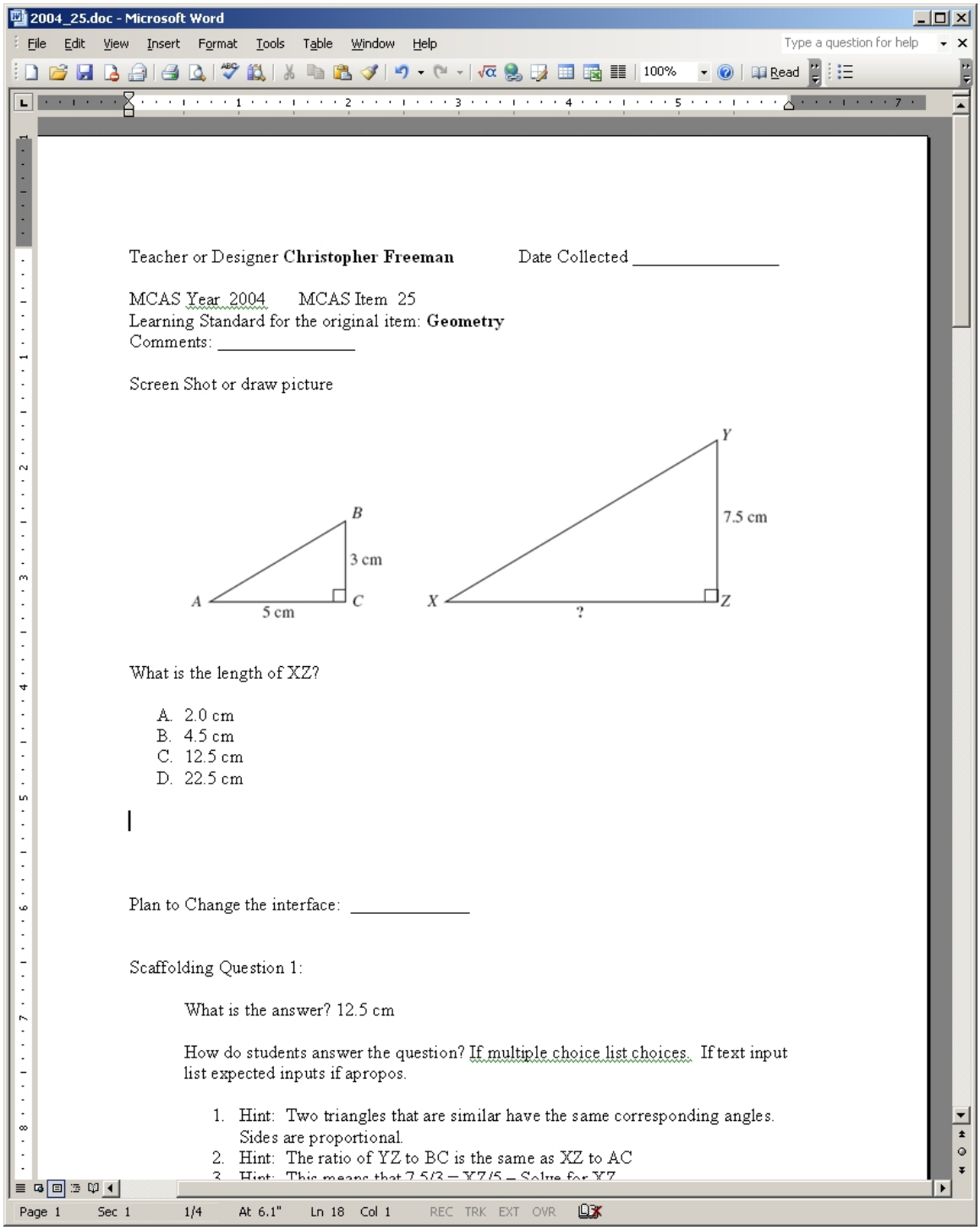


Figure 3-2 - A sample template filled out for an MCAS Geometry problem (#25 from the Spring 2004 Exam)

3.1.2.2 Building the Assistments

Our builder work was done through the Assistment web site. Through the builder, shown in Figure 3-3, we translated the content from our drafts into Assistment problems. For the most part, this process is straightforward. The text needs to be translated from the draft into the corresponding text fields. The appropriate flags need to be set. For example, a correct answer needs to be flagged as correct or the response type must be changed to multiple choice of text entry. While the process is straightforward, it is also time consuming. This is why we opted to draft our content first.

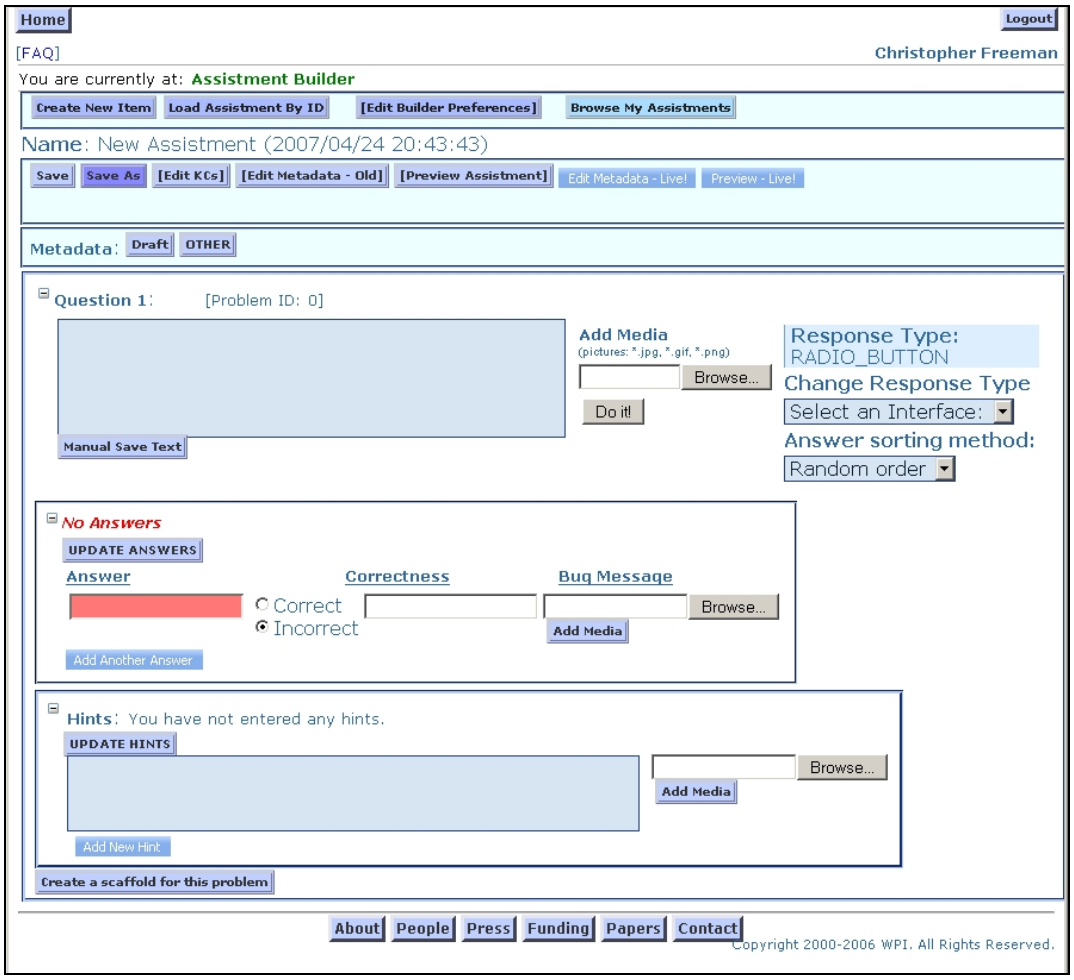


Figure 3-3 - The Assistment builder screen

When building assistments from drafts, the most time consuming work was translating handwritten sketches into computerized pictures. In addition, text formatting would need to be translated into HTML.

One of the challenges of working with the builder was that it was constantly being updated and changed. This sometimes made the software either unavailable or unreliable at times, but this was expected as we were worked on a system that was still undergoing development.

In addition to building the actual problem, other information needed to be entered in the builder. Using the Metadata form, we labeled each problem by which MCAS test it was from and whether a calculator was allowed or not. One of the other things that would be done through the builder is tagging each question with its knowledge components, but this feature was not working during the time we were expecting to enter this information. Figure 3-4 shows the builder look at the finished Assistment version of an MCAS Geometry problem.

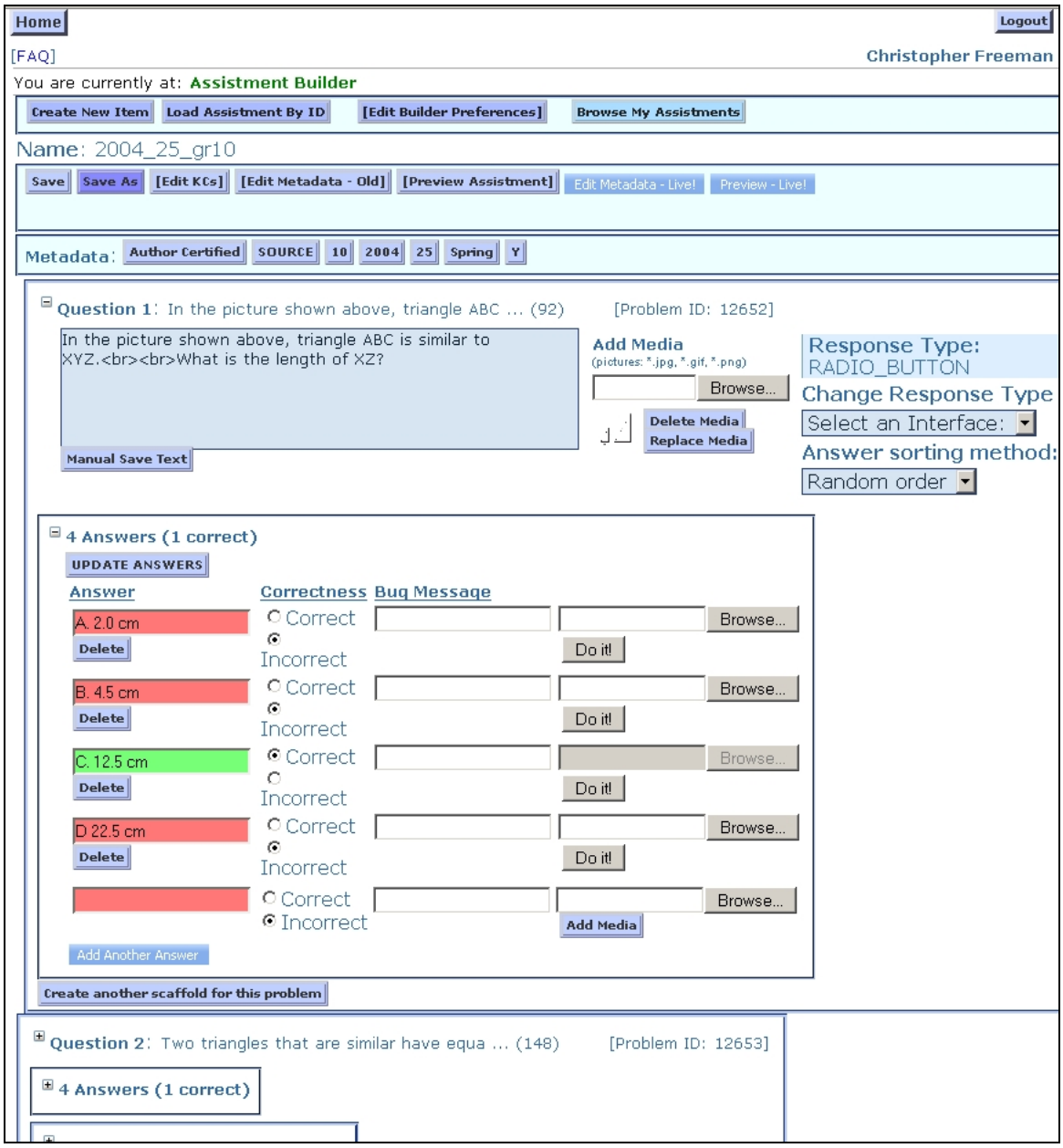


Figure 3-4 - A view of the builder for the MCAS Geometry problem shown in Figure 3-5.

3.1.3 Workflow

Our goal for content creation was to develop an Assistment problem for each MCAS problem to date. In order to try to accomplish this goal, we had to set up an organized

procedure for handling the workflow. Our initial goal was to draft 10 Assistments a week. Drafts would be critiqued and reviewed weekly by Cristina Heffernan, our resource for pedagogical information. Sometimes edits to our drafts were minor and a whole different approach was needed.

After a draft was approved, work could begin on the Assistment version. When the Assistment problem was completed, it would also be reviewed and edited. After the review process for the built version, the Assistment would be considered complete and certified. After a few weeks of work, we had many Assistments in many different stages of development and the expectation of developing more. A typical week in A-Term involved drafting new Assistments, building approved Assistments, and editing drafted/built Assistments.

During B-Term, the responsibilities of A-Term remained, but there were more tasks to work through as well. At this point, we began to determine and record the Knowledge Components for each of our problems. We also developed the rest of the material that was necessary to facilitate our study on hints vs. scaffolding problems. This included creating hints-only (No scaffolding) versions of some of our problems and grouping similar problems together. We also went into local high schools and had our content tested by 10^{th} grade students.

During D-Term, we were expected to complete fewer Assistments as our focus was on running the study. In addition, we researched other web-based tutoring systems.

3.1.4 Refinements

As the project progressed, we found that our methods could be adjusted to make our workflow more efficient. We sometimes found some steps could be improved upon or some steps were not necessary.

3.1.4.1 Peer Review

One of the more helpful additions to our process early on was the introduction of peer review. Within our small teams, we would pass around our drafts and built Assistment printouts to be reviewed by each other before having them reviewed our Cristina. This extra review time ensured better quality content.

3.1.4.2 Ticket System

One of the things that we tried to keep better track of our review process was to keep all the material and printouts pertaining to one problem together and maintain a ticket. This ticket kept track of the phases the problem had already gone through and had yet to go through. This ticket maintained the number of times it had been edited and who edited it.

3.1.4.3 Drafts

As we became more familiar with how to approach problems and more comfortable with the builder tool, drafts became less useful so we opted to skip them. In lieu of drafts, we simply printed out the problem and a description of our intended approach. We would go over this approach with Cristina and make any appropriate changes before going straight to the builder with it.

3.1.5 Additional Work

3.1.5.1 Quizzes

Christopher Freeman and Michael Zhang also constructed a large amount of seventh and eighth grade content. They built quizzes to test students on the material covered in the books from the Connected Mathematics Series which the local middle schools were using. The quizzes contained hints only, and were designed to teach the student as well as to evaluate their performance. Thus, the hints explained to the students and ultimately gave the student the correct answer as the last hint. This did not affect the quizzes' ability to evaluate their performance since the online data logging system would still recognize that they initially got the question wrong, or asked for hints, in order to get the question correct. Building so much content exclusively using hints helped in learning to write effective hints. Since we did these quizzes prior to writing the hint versions of the questions used in the experiment, we can be sure that the result of the experiment has not been affected by our ability to write comprehensive and effective hints.

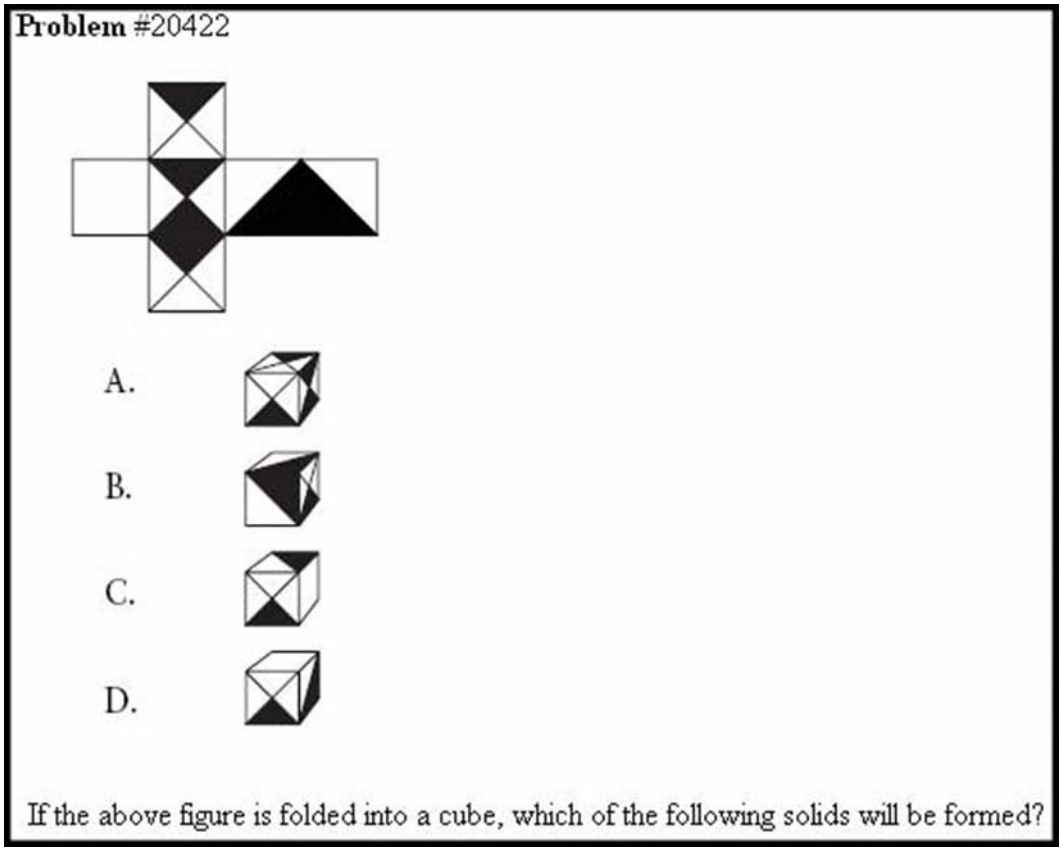
3.1.6 Content Walkthrough

3.1.6.1 ASSISTment ID#20422

The following ASSISTment was created by Roderick Taylor. It is based off the seventh item on the 1999 MCAS 10th grade Math Test.

Original Problem:

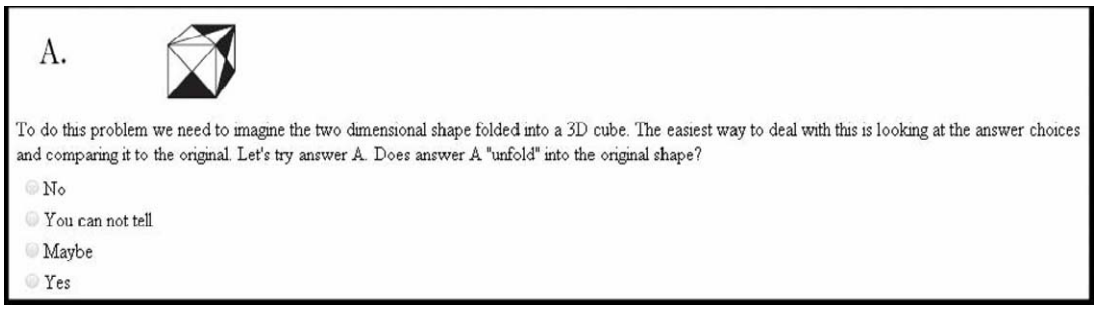
The original problem, seen below, was taken directly from the 1999 MCAS 10th grade Math Test.



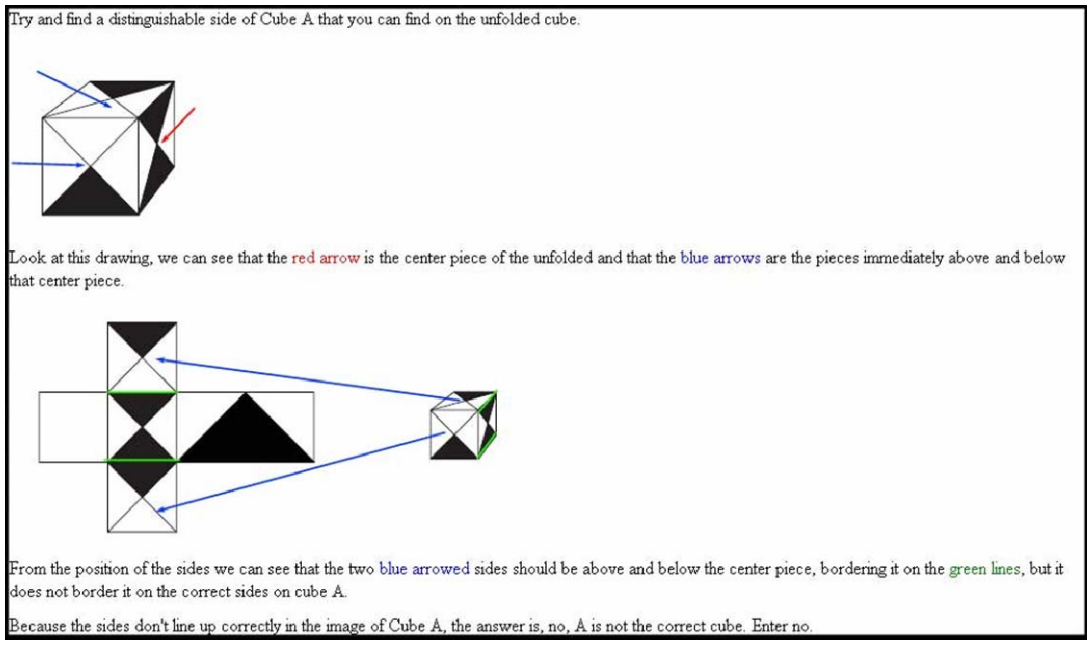
This problem posed a particular problem for the builder due to the abstractness of any explanation given. The best way for a human tutor to explain a problem such as this would be to actually create the object shown. However, given the sole use of a computer screen several steps were made to show how a student would be able to answer this question.

The following is an image of the first scaffolding question that was created to augment this

problem.

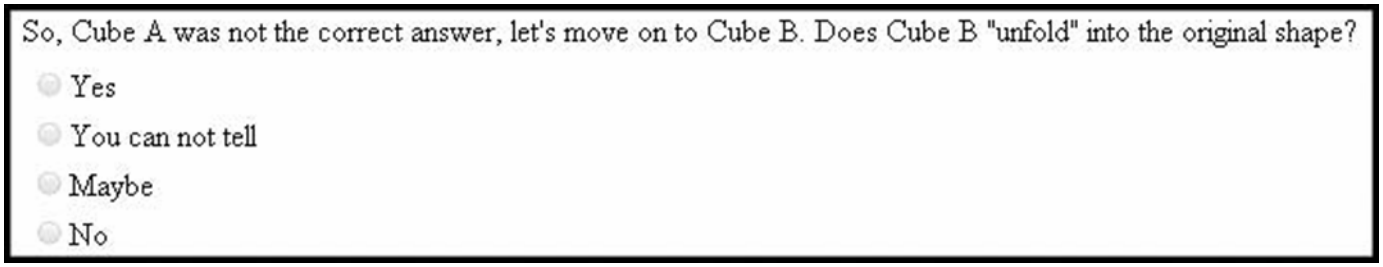


The method used was to look at each answer and deduce whether the box created for it could possibly be the original "flat" box. By doing this the builder was able to properly guide the student into "seeing" the three dimensional object as the same as the two dimensional object and, hopefully, learn project the unfolded box in their mind. Assuming the student was unable to get Scaffolding question 1 right, the following hints were given to them.

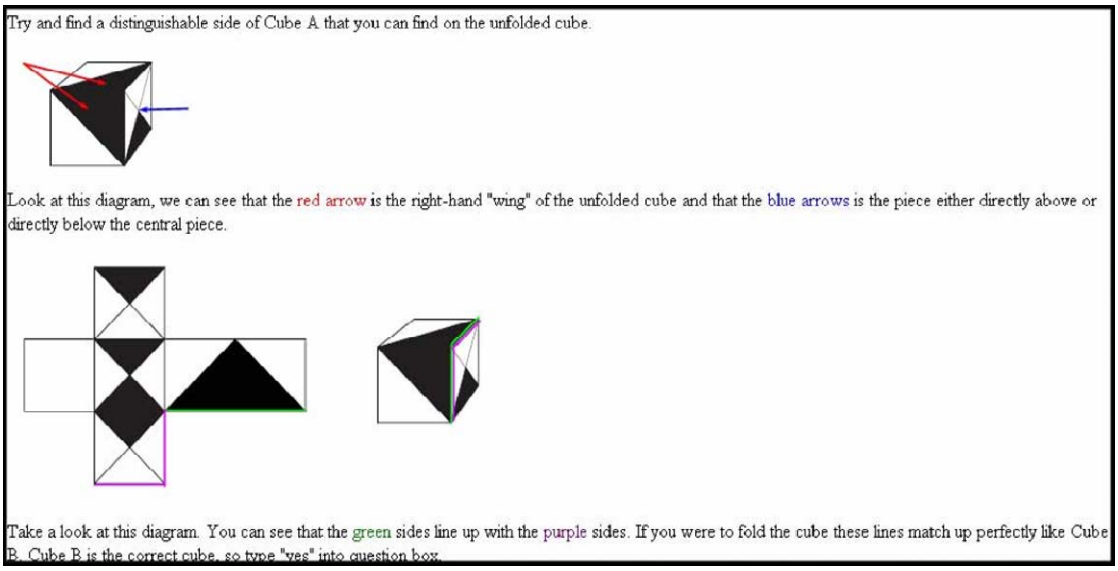


The idea used was to guide them through color-coded arrows and sides which match up to corresponding sides on the original unfolded cube. Through this method the gap

created by the lack of actual visual interaction is bridged and the student is able to “see” where the sides should go. By color coding the text, the sides are more easily found and identified. A method for answering this and similar questions is given to the student. In the next scaffolding question they are asked the same question for Answer B; however they now have an opportunity to do it on their own.



If they can do this they can move onto the final restatement of original question. If not, the following hints are given to them to guide them once again.

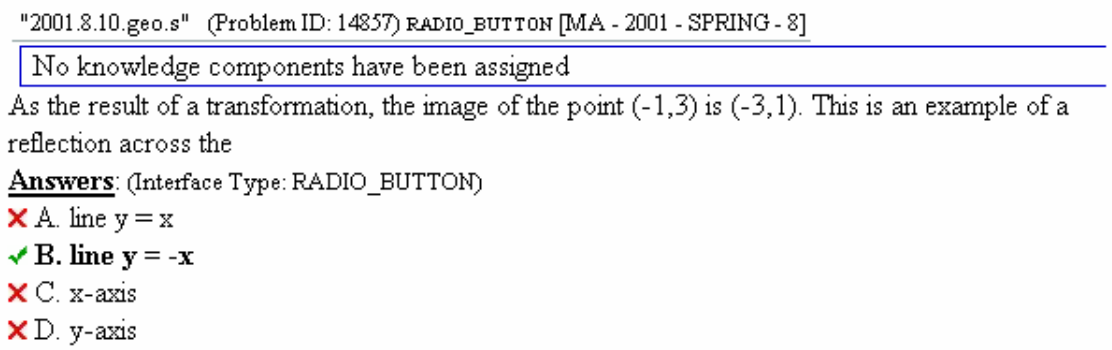


As you can see this was the final question. The second box was the correct answer. In this case this is the final question, because, using the method prescribed, the final answer was found. This is good in many ways because it prevents the student from going through 4 examples of the boxes; also, it teaches them that using a methodical answer

check, such as this, the student will be able to move on as long as he/she is sure of the correctness of the answer. On a time based test, this can be helpful on problems that require extra time to solve or deduce.

3.1.6.2 ASSISTment ID#14857

This problem is number 8 of the Spring 2001 MCAS Mathematics section for the 10th grade. It is part of the Geometry strand. When approaching a new problem, the first thing I do is to solve the problem myself to get a perspective on how I approach the question. Next, I look back to see if all of the concepts I used to solve it are at a 10th grade mathematics level. Then, I consider whether the method I used is abstractly conducive for representation in the online tutoring system. The problem is shown below:


"2001.8.10.geo.s" (Problem ID: 14857) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

As the result of a transformation, the image of the point (-1,3) is (-3,1). This is an example of a reflection across the

Answers: (Interface Type: RADIO_BUTTON)

✗ A. line y = x

✓ **B. line y = -x**

✗ C. x-axis

✗ D. y-axis

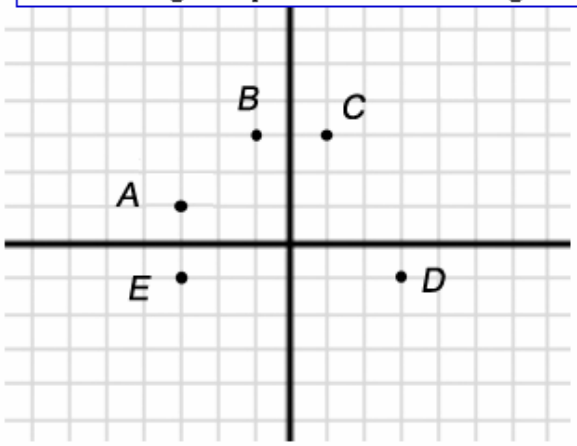
Problem 8 of the 2001 Spring MCAS.

For this question, the way I solved it was to mentally plot both points and find line of reflection intuitively rather than procedurally. This method lacked a clear procedural method that could be explained to the student, and involved mental imaging which is difficult for students who are still learning to plot points manually on a graph.

To devise a strategy for solving this problem, I considered what concepts are necessary for comprehending, understanding, and solving the problem. A general rule of thumb, which had evolved from the experience of building so many assistments, was the importance of having the student draw a picture. I also identified the first part of the question as being locating the two specified points. They naturally combined to form the first scaffolding question shown below:

(Problem ID: 14858) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned



This is the type of problem where a sketch will help. Start by plotting the points!

Which pair of points in the image above are the two points given in the question?

Answers: (Interface Type: RADIO_BUTTON)

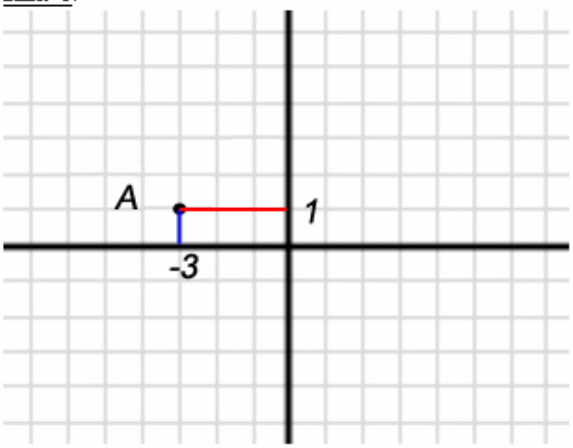
✗ D and A
✗ A and E
✗ C and E
✓ **A and B**

Scaffolding Question 1

Now that the first scaffolding question had been written, I needed to write hints to assist the student if they had trouble with the scaffolding question. Since the goal of the question is to plot the two points, I had the first two hints explain how to plot each of the

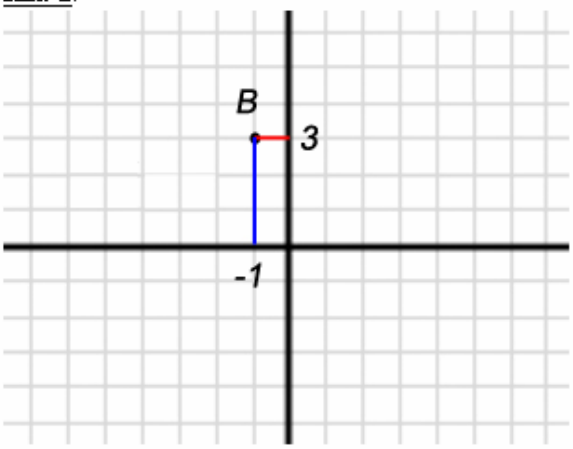
points. The final hint is what we refer to as a ‘bottom out hint’, which always gives the student the correct answer. This is to keep the student from becoming stuck and unable to proceed.

Hint 1:



The point A (-3, 1) is shown above. Notice how the red line shows that it is at 1 on the y-axis, and the blue line shows it is at -3 on the x-axis.

Hint 2:



The point B (-1, 3) is shown above. Notice how the red line shows that it is at 3 on the y-axis, and the blue line shows it is at -1 on the x-axis.

Hint 3:

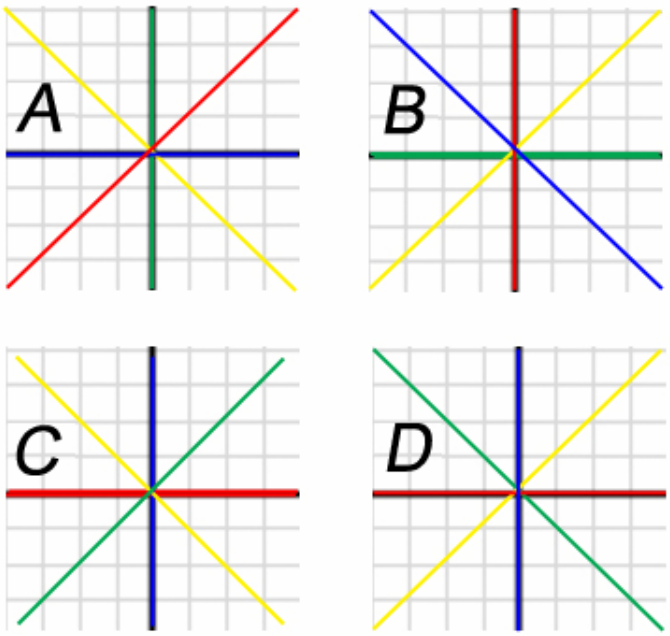
The two points that are given in the question are points A and B. Choose answer choice A and B.

Hints for the first scaffolding question

The next scaffolding question represents a scaffolding design principle that we had decided upon as a group. Since there are naturally several methods to think about and solve a problem, some more difficult in some aspects than others, we had to decide upon a consistent method for choosing one. One such principle was that the method should take advantage of common test taking strategies. The strategy used here in this question is to look at the available answer choices and use them to help you solve the problem. For example, in this problem, instead of finding the line of reflection given just two points, the student looks at the answer choices and sees which ones satisfies the definition of a line of reflection. The next scaffolding question asks the student to know what each of the lines offered as answer choices looks like on the graph.

(Problem ID: 14859) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned



Which of the above images shows:
line y = x in green
line y = -x in yellow
x-axis in red
y-axis in blue?

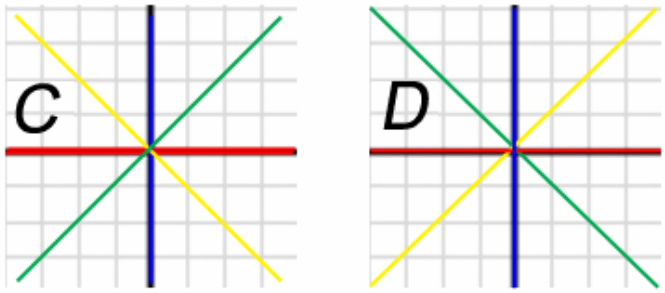
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ C
✗ D

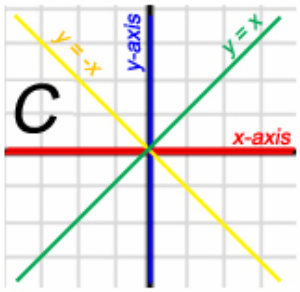
Scaffolding question 2

The hints for this scaffolding question, once again, involved a basic design principle based upon widely accepted and used test taking strategies: for multiple choice questions, find the correct answer by eliminating incorrect answer choices. Thus, the hints for this question were formed as follows:

Hint 1:
Start by finding which of the answer choices has the x-axis and y-axis graphed correctly.
Hint 2:



Graphs C and D have the x-axis and y-axis graphed properly. Now which of these graphs has y = -x graphed correctly?
Hint 3:
y = -x is a line with a negative slope. That means that the the yellow line should be going from the top left to the bottom right.
Hint 4:



The graph that has all the lines graphed correctly is graph C. Choose answer choice C.

Hints for scaffolding question 2.

At this point, the student as identified both of the points in the question as well as the lines offered as answer choices. We can finally ask the student for the answer to the original question. If the student is unable to answer this question, we know that the aspect of this problem that he does not understand is the concept of a reflection transformation. This feature is one of the major benefits of a scaffolding question system. The ability to identify specifically and accurately what concepts of a complex question students are

having trouble with is a powerful tool for teachers to identify areas that they should supplement in the classrooms.

(Problem ID: 14860) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

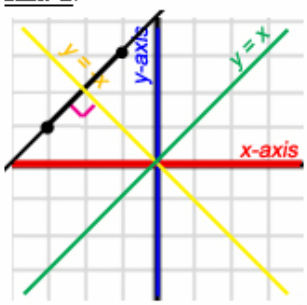
Now that we have plotted both of the points and all four of the answer choices, we can decide which line the point (-1, 3) was reflected across to get its image (-3, 1).

As the result of transformation, the image of the point (-1, 3) is (-3, 1). This is an example of reflection across the:

Answers: (Interface Type: RADIO_BUTTON)

✗ A. line y = x
✓ **B. line y = -x**
✗ C. x-axis
✗ D. y-axis

Hint 1:
A line drawn from a point to its reflected image is perpendicular to the line of reflection.
Hint 2:



Above is a picture showing the points, the lines of reflection, and the line passing through both the point and its image.
Hint 3:
The black line is perpendicular to the line y = -x.
Choose answer choice B.

If the student misses this question, the hints explain to him what it means to have a reflection across a line. If a textual explanation is insufficient, the second hint provides a image to illustrate the concept visually. Finally, the 'bottom out' hint is given.

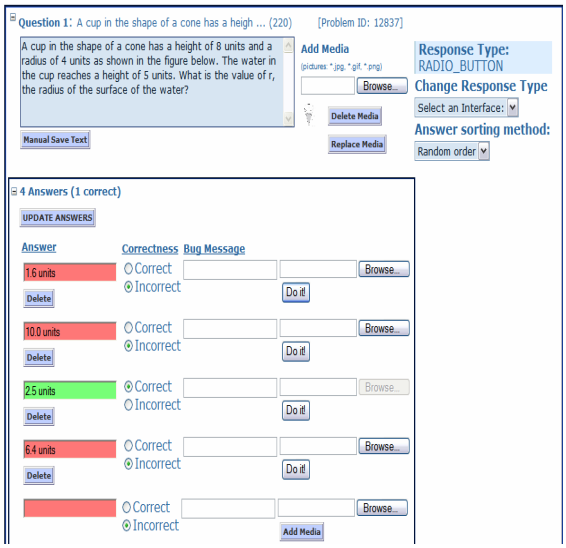
What seems like a very short and simple two sentence question has, in fact, a large amount of depth for tutoring. The design principles used in designing this question evolved over two terms of experience of our entire team. We made common use of color in the images to make distinctions and highlight important parts. Also, with progressive hints, we update the images with labels of information attained in previous hints of scaffolding questions.

Since our group was mostly doing geometry and measurement, both involving significantly more visualization and abstract object representation and comprehension, we found ourselves using images and visual explanations significantly more so than other groups. This resulted in increased assistment development time and complexity. Nonetheless, our group produced an equivalent amount if not more than the other groups!

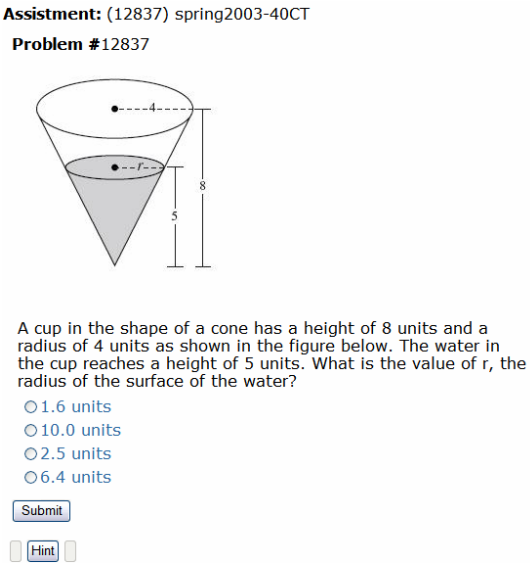
3.1.6.3 ASSISTment ID#12837

Below is the mechanics and the thought process Cosmin Tudor undertook while building tutoring content for a particular problem.

Assistment: (12837) spring2003-40CT



Main Question in Builder

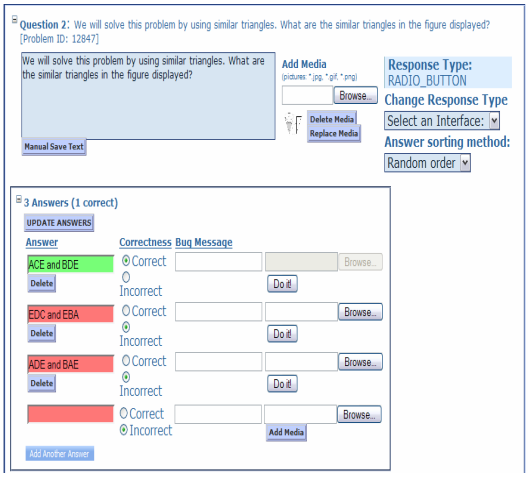


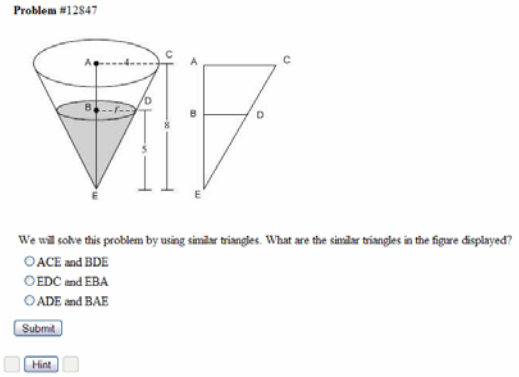
Student view

When a new assistment is created the builder provides the main question and scaffold questions in order to guide the student through the thinking process needed to solve the problem. Each scaffold question has a series of hints that progressively go to the correct answer.

Figure 1 shows a geometry problem and the four possible answers. The correct one is indicated by the builder. In Figure 2 we have the student view of the problem. The student must analyze the information given by the problem and use it in order to answer the question: “What is the radius of the surface of the water?”

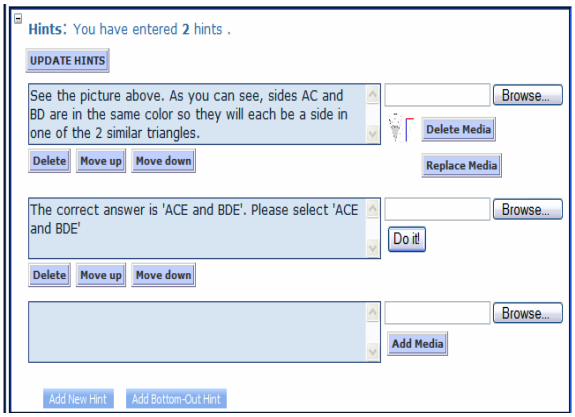
The student will choose the correct answer or he or she will use the “Hint” option in order to get on the right track in solving the problem.





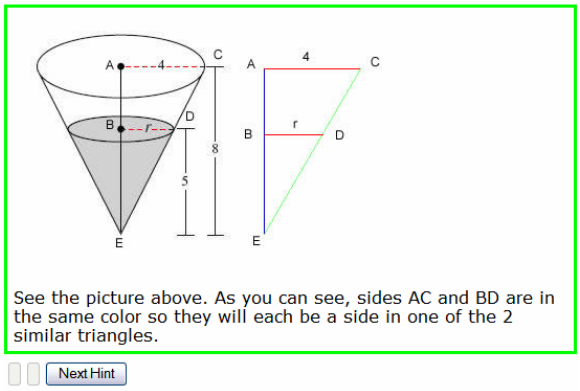
First Scaffold Question in Builder **Student view**

When the student clicks the "Hint" link the first scaffold question appears. This question is meant to show the underlying geometrical concept user, which in this case is "similar triangles". Using this concept the student must answer the first scaffold question.

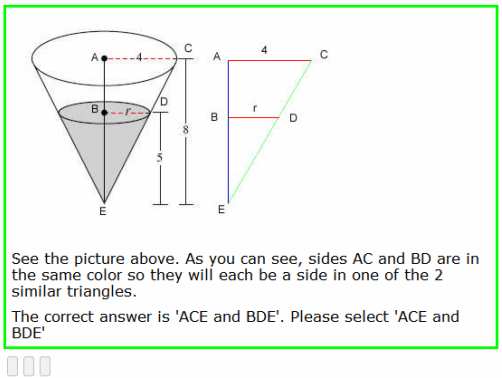


Hints for Scaffold 1 in Builder

The builder as provides a series of hints that will lead the student to answer correctly the scaffold question as we see in Figure 5.

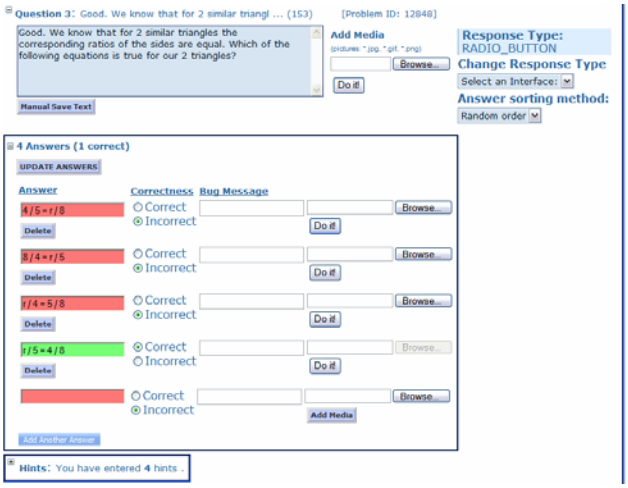


Scaffold 1, Hint 1

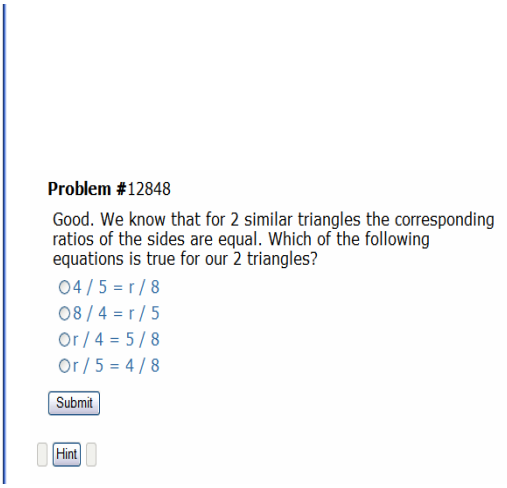


Scaffold 1, Hint 2

If the student cannot figure out the answer to the scaffold question he is given a first hint that is meant to point him I the right direction and explore further the concept of “similar triangles” by finding two similar triangles in the picture provided (see Figure 6). If the student still has difficulty in identifying the similar triangles the builder provided another hint with the correct answer of the first scaffold question.

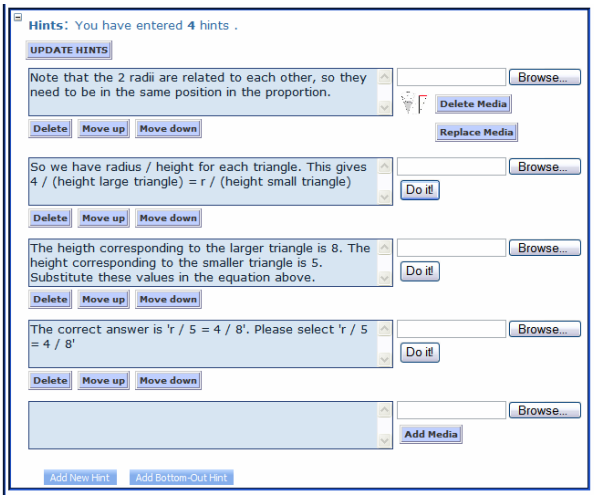


Second Scaffold Question in Builder



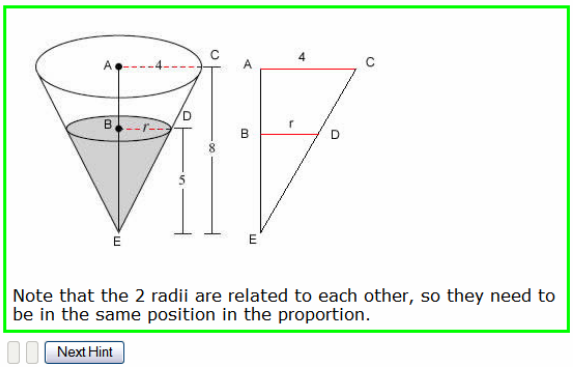
Student view

Once the student has solved the first scaffold question he must move on to the next one. The second scaffold question uses the first geometrical concept – similar triangles- and adds another related concept about a property of similar triangles. This question explores the relationship between the ratios of the sides of the two similar triangles. Using the ratios between the sides of the two triangles the student must identify the equation that summarizes this relationship. He can either choose the correct answer or get more help by using the "Hint" option.

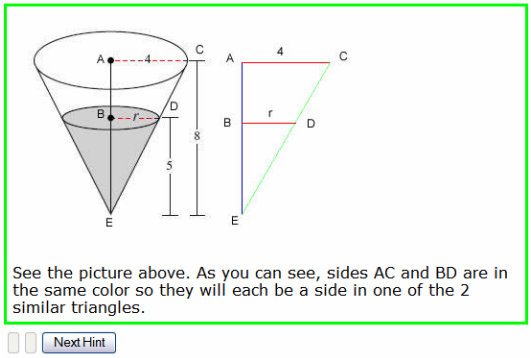


Hints for Scaffold 2 in Builder

The builder provides a series of hints that will lead the student to the correct answer as seen in figure 10.

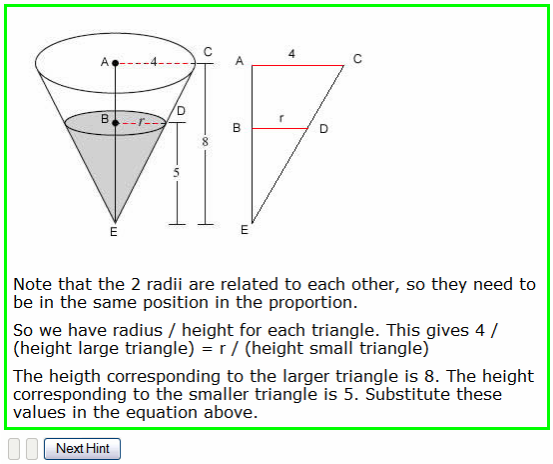


Scaffold 2, Hint 1

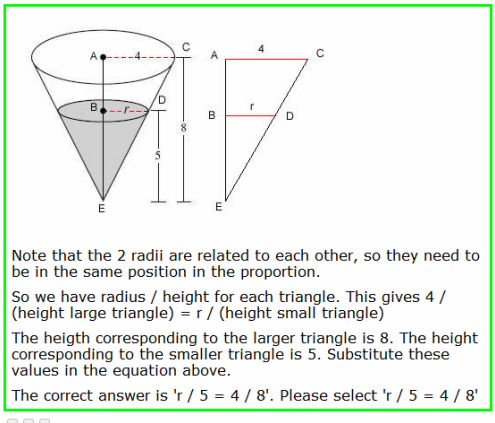


Scaffold 2, Hint 2

This hint provides a visual aid in order to clarify the relationship between the two similar triangles identified in Scaffold 1. The first set of corresponding edges is shown in order to determine the first ratio. The second hint goes further in determining the next two ratios. The builder used colors to visually show the connection between the two similar triangles.



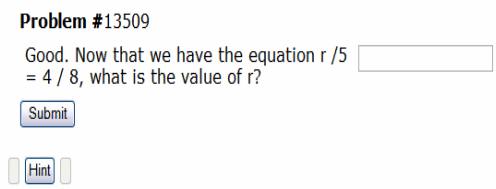
Scaffold 2, Hint 3



Scaffold 2, Hint 4

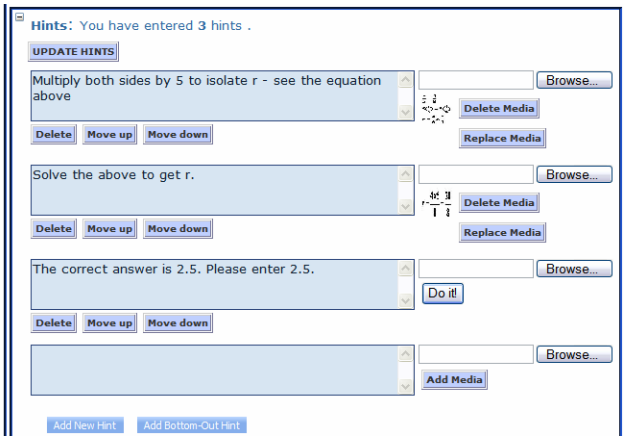
If the student still has difficulty in determining the equation resulting from the similar triangles, the builder provided another hint that gives more detail on the relationship of the triangles. From Figure 13 we can see that the builder put together the information from the previous hints and went a step further by giving the equation that puts together the ratios of the sides of the two triangles. The ratios are given in terms of the given information and the heights of the triangles. The last hint explicitly gives the correct answer by giving substituting the elements of the equation by their numerical value. Now the student is able to answer scaffold question 2 and move on to the next one.

First Scaffold Question in Builder



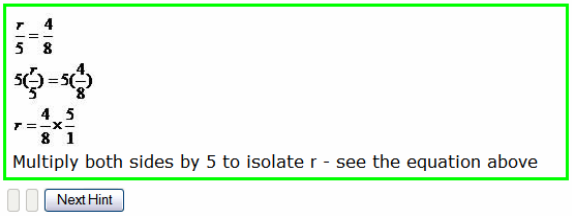
Student View

A third and last scaffold question is provided in order to help the student give the correct answer to the original question. This scaffold builds on the previous scaffold question and asks the student to solve the equation determined as an answer for the previous scaffold.



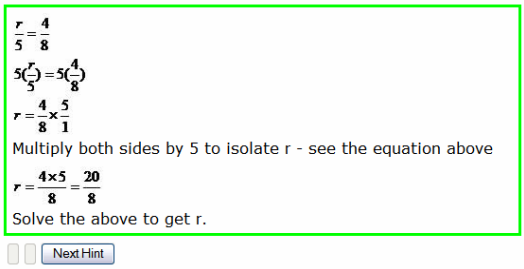
Hints for Scaffold 3 in Builder

As usual the builder provides a series of hints that will progressively lead to the correct answer for this question and for the original problem.



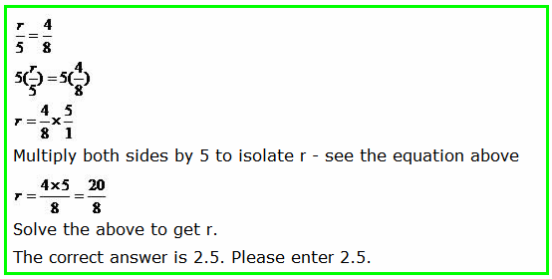
Scaffold 3, Hint 1

In case the user does not know how to manipulate the equation such that r is given in terms of all the other constants, the first hint walks them to the desired set up of the equation. The hint shows the intermediate steps needed to get to the final form of the equation.



Scaffold 3, Hint 2

The second hint starts showing the actual computation for r without giving away the whole answers. The student can check this hint in order to make sure they are on the right track of the calculation.



Scaffold 3, Hint 3

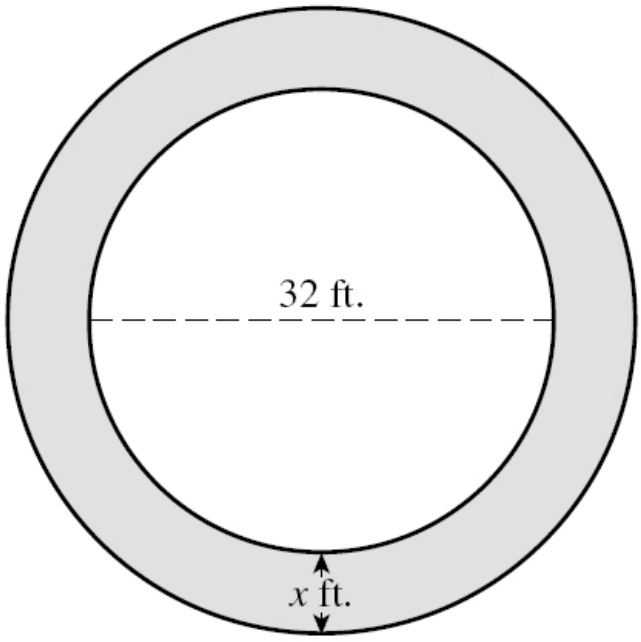
The last hint continues the calculation from the last hint and gives a numerical answer for the scaffold question. This is the correct answer to the original question.

The builder uses a series of scaffold questions that progressively lead to the correct answer. Each scaffold question uses the result from the previous scaffold and builds on it by introducing new geometrical concepts or calculations. The hints are also put in a progressive way such that each hint builds on the previous one.

3.1.6.4 ASSISTment ID#21899

The following Assistment was created by Christopher Freeman. It is based off problem #29 from the March 2005 MCAS Retest. It is categorized as a Measurement problem.

Problem #21899



A circular pool with a diameter of 32 feet is surrounded by a wood deck of uniform width.

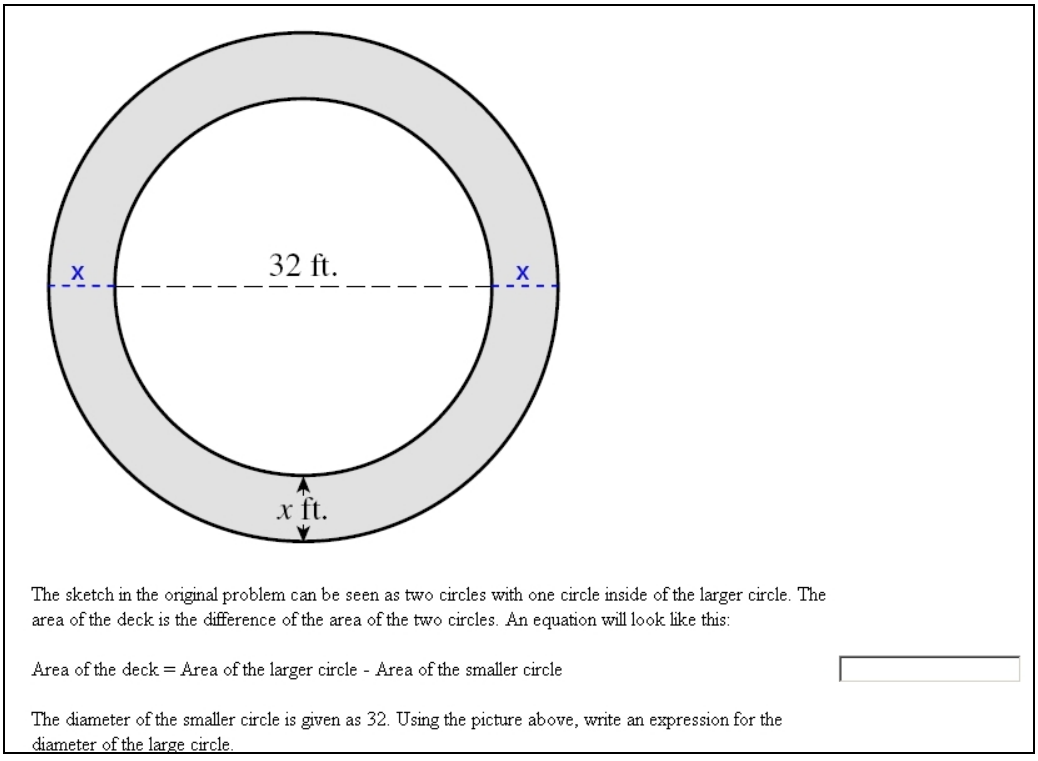
If the area of the deck is 68π square feet, what is **x**, the width of the deck?

- A. 0.5 ft.
- B. 1.0 ft.
- C. 1.5 ft.
- D. 2.0 ft.

Geometry Problem #29 in the MCAS March 2005 Retest

For the problem shown in the figure above, students will have to recognize and establish the relationship between the areas of the two circles with respect to the shaded region. In order to solve the equation for the relationship, students will have to apply the formula for the area of a circle.

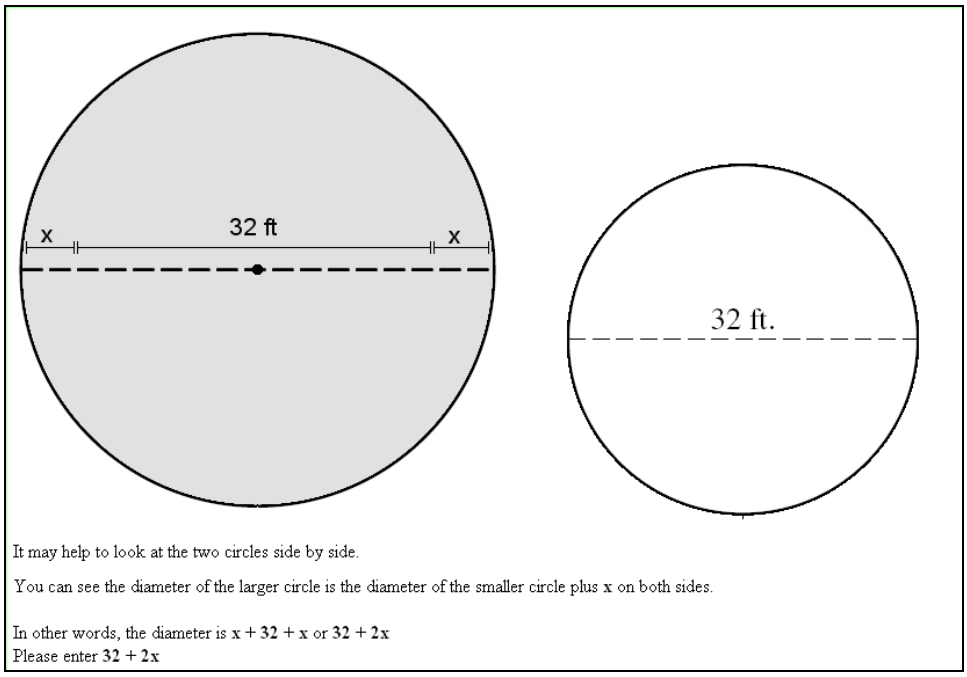
To construct a meaningful set of scaffolding questions to aid a student in solving the problem, it is important to have a reasonable plan of attack. For a problem like this one, I would first want a student to digest the given picture and establish the information that is available to them. Secondly, the relationship that will solve the problem should be set up. After the relationship is set up, the student should solve the resulting algebraic equation.



Scaffolding Question #1

For the first scaffolding question, shown in the figure above, we dissect the given picture slightly for them. In addition, we also introduce the basic relationship between the circles that will later help solve for x. The students are given the diameter for the smaller circle which will help them solve for the area of that circle, but they need the diameter of the larger circle in order to solve for its area. So we ask the student what the diameter of the larger circle is.

As we get to writing hints about this particular scaffolding question, it is important to focus on the particular difficulties of the question that was asked. In this case, the diameter of the larger circle needs to be determined. Students are possibly having trouble visualizing the larger circle and are not quite sure how to find its diameter. The hints for this question are geared at helping the students break down the image. In the next figure, we can see that the two circles have been placed side-by-side instead of one inside the other. The known measurements have also been marked. Students will hopefully now be able to recognize that the diameter of the larger circle is the composite of 3 separate lengths.



Hints for Scaffolding Question 1

After students have established the diameter of the larger circle, it is time to ask a question about the relationship between the areas of the circles. The next scaffold question, shown in the next figure, has the student set up the equation for the relationship between the areas of the circles. The student is reminded of all of the information he or she knows already.

In hints for this problem, we are trying to help students who are having difficulty applying the formula for the area of a circle. The hints help the student identify the correct formula, substitute in the correct values, and recognize how they are applicable to relationship we already established.

Problem #21940

We now know the diameters of both of the circles. As we stated earlier, the equation is:
area of the deck = area of the larger circle - area of the smaller circle

We know the area of the deck to be 68π, we need to know the areas of the circles. Which of the following equations correctly represents all of the areas and the relationships between them?

- A. $68\pi = \pi (32 + 2x)^2 - \pi 32^2$
- B. $68\pi = 32\pi - (32 + 2x)\pi$
- C. $68\pi = (16 + x)\pi - 16\pi$
- D. $68\pi = \pi(16 + x)^2 - \pi 16^2$

Scaffolding Question 2

Recall from your reference sheet that the area of a circle is:
$A = \pi r^2$

We know the diameters of the circles, but we need to know the radii.

The radius of a circle is half of its diameter.
Remember, the diameters of the circles are:
$d_{large} = 32 + 2x$
$d_{small} = 32$

The radii of the circles are:
$r_{large} = 16 + x$
$r_{small} = 16$

Now substitute these radii into the formulas for the area of a circle.

The areas of the circles are:
$A_{large} = \pi(16+x)^2$
$A_{small} = \pi(16)^2$

Substitute those areas into the original equation:
Area of the deck = area of the larger circle – area of the smaller circle

Therefore, the relationship between the areas is:
$68\pi = \pi(16 + x)^2 - \pi 16^2$
Please select D.

Hints for Scaffolding Question 2

Now that students have set up a equation for the relationship, they should be able to see that they can solve for x which is the original problem. The next figure shows the problem that is asked for this 3rd and final scaffolding question. The problem is reduced simply to algebraic manipulation. Even though the focus of this problem is Measurement, it is still possible the student struggles with Algebra so we will provide hints that walk the student through the algebraic steps.

Problem #21941

Now, we can solve for **x** using the equation we just found.

$68\pi = \pi(16 + x)^2 - \pi 16^2$

Solve for **x**

- A. 0.5 ft.
- B. 1.0 ft.
- C. 1.5 ft.
- D. 2.0 ft.

Scaffolding Question 3

In the hints, the student is walked through the simplification process for the equation. The student is shown the use of the distributive property, combining like terms, and solving a quadratic formula with factoring.

Start by expanding the term $(16 + x)^2$ and then grouping like terms on one side of the equation.

$(16 + x)^2 = 16^2 + 32x + x^2$

Now put this result back into the equation:

$68\pi = \pi(16^2 + 32x + x^2) - \pi 16^2$

After distributing the π across $(16^2 + 32x + x^2)$

$68\pi = 16^2\pi + 32x\pi + x^2\pi - \pi 16^2$

Now, combine like terms.

$68\pi = (16^2\pi - 16^2\pi) + 32x\pi + x^2\pi$

$68\pi = x^2\pi + 32x\pi$

We have a quadratic equation. To solve it, subtract 68π from both sides of the equation. This will make the left side zero and then we can factor.

$68\pi - 68\pi = x^2\pi + 32x\pi - 68\pi$

$0 = x^2\pi + 32x\pi - 68\pi$

Now we can factor the equation.

$0 = (x + 34)(x - 2)$

So, $x = -34$ or 2.

Since -34 does not make sense for the width, 2 is the only other option for x. So the value of x, the width of the deck, is 2. Select D.

Hints for the Scaffolding Question 3

4 Study

4.1 Hypothesis

The ASSISTment system aids students in learning Mathematics. In addition, scaffolding questions are more effective than hints-only questions in helping students learn how to solve mathematical problems on the MCAS.

4.2 Method

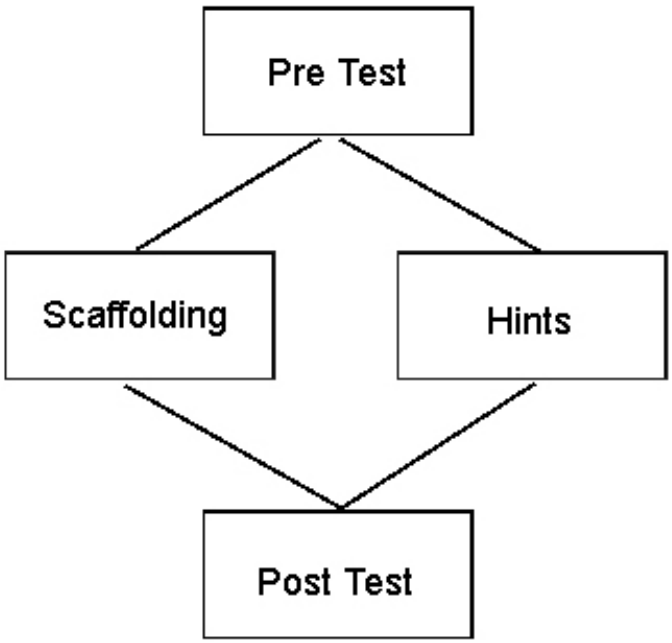
Setting up the Experiment

Our group was not the only group of students working on this experiment. Each group was assigned a certain content strand. Our group worked primarily from the Geometry and Measurement strands. This allowed each group to become familiar with similar types of questions and consequently create more effective explanations. Having each group have similar questions would prove useful later in the experiment when constructing the experimental curriculums.

Experiment Curriculum Structure

After each of us created several scaffolding assistments each, we separated our questions in to groups. We chose groups by finding questions that required the same knowledge and concepts to solve them. These groupings ranged in size from three to five problems. We then created hint versions for half of the questions in each group. These groupings were then separated into one of three categories: number sense, algebra, and geometry/measurement. A curriculum for each of these categories was created. A

curriculum consisted of several groupings of questions. The structure of these experiments is shown below:



Experiment sessions

Experimental sessions were done at Shrewsbury High School and Worcester North High School for approximately 50 minutes each. Students would enter the computer lab and sit down at a computer. The experiment administrator would inform the students of which curriculum they were to perform. Students were informed that they were to treat this as a test, meaning that there was to be no collaboration between students. At Shrewsbury

High, approximately five out of a class of twenty would complete all of the experiments in the number sense experimental curriculum on average.

Recording Data

Using the online system, all actions performed by the students was logged. The Assistment System allows teachers to view a grade book detailing each student's performance on each problem. In this manner, we were able to record data without mistakes.

The Students

The classes at Worcester North High School Shrewsbury High School typically consisted of a combination of 9^{th} and 10^{th} graders. The students in this course typically had a background of mathematical education up to Algebra, meaning that most students had not taken or were currently taking a course in geometry. In order to test to see if the students were learning at Shrewsbury High School, we moved from the number sense curriculum, which they were mostly performing already very well on, to geometry which forced them to struggle and learn new concepts with our system. In contrast, the North High school classes we ran the study with produced reasonable data for each experiment curriculum so we treated each curriculum equally.

Experimental Environment

The experiments performed at Shrewsbury High School were done in a computer lab supporting approximately twenty students. They were using well functioning Apple computers with keyboards and mice in good condition. The lab was clean and in well organized with no external distractions. North High students used a computer lab with a combination of Windows XP laptops and desktops. At North High, sometimes the lab was filled to capacity or sometimes supported two classes at a time. In both schools, students sat in close proximity to other students, and were able to communicate with neighboring students for assistance, though they were told not to. The teacher of the class was also present in both schools. The teacher was instrumental in keeping the class focused on working and keeping them from collaborating.

Content

All of the questions used in the experiment were taken directly from the past exams released on the MCAS webpage. Scaffolding questions, hints, and supporting images were novel creations created by us.

4.3 Data

Category: Number Sense										
Experiment: 1										
School: North High										
Sample: School-wide Results as of April 25th, 2007										
Pre-Test		**Scaffolding**		**Hints**		**Post-Test**		**Gain Scores**		
#21220	#21241	#13599	#15005	#15636	#15646	#13389	#14557	Gain1	Gain2	GainSum
0	1	0	1			1	1	1	0	1
0	1	0	0			0	1	0	0	0
0	1	1	0			0	1	0	0	0
1	1	1	0			1	1	0	0	0
0	0			1	0	1	0	1	0	1
0	1			1	0	0	1	0	0	0
0	1			1	0	0	1	0	0	0
0	1			1	0	0	1	0	0	0
1	1			1	0	1	1	0	0	0
1	1			0	0	1	1	0	0	0
1	1			1	0	1	1	0	0	0

Figure 4-1 - Sample data (after processing) for North High school. This is the accumulation of all of the data available for this particular experiment since it was introduced.

In order to obtain the data we were looking for, we needed to do a large amount of processing of the raw data. Using the Assistment gradebook, we were able to pull up the results for each of our studies. While our focus was creating the Geometry/Measurement curriculum, we looked at the data from the Algebra and Number Sense curriculums as well. The Algebra and Number Sense curriculums had been running longer and had more data.

We reconstructed the results for each experiment into the format shown in Figure 4-1. Figure 4-1 shows Pre-Test, Scaffolding, Hints, and Post-Test results. The values we were interested in were the gain scores. The gain score was computed by taking the different of corresponding pre-test and post-test questions. A positive gain score means the

student did not get the answer correct in the pre-test, but after completing their conditional questions, hints or scaffolding, they got the answer correct in the post-test.

In addition to calculating gain scores, results for some students were not applicable and needed to be removed. Students who ace their conditional hint or scaffolding questions will have never seen a hint or a scaffold component. Thus, comparisons between hints and scaffolds are not applicable for this user. Also, incomplete data cannot be used. Thus, a student must have done an experiment from start to finish. Otherwise, their results are not useful either.

In some results, there were sometimes suggestions of "unlearning". A student would get the pre-test question right, but when they saw it again in the post-test question they would get it wrong. This was an infrequent occurrence and may be attributed to user error when interacting with the software.

Usable data from the experiments is presented in our report appendix. After processing the data, we were able to begin our statistical analysis.

4.4 Analysis

On a range of different data, we conducted several statistical tests to attempt to validate our hypotheses. One of the first questions we wanted to answer was "Are students learning with the Assistment software?" Furthermore, we wanted to know whether students learned with the hints versions and with the scaffold questions, separately.

Lastly, we wanted to determine which of hints or scaffolding questions were more advantageous for learning.

We analyzed the data from many of the experiments. However, we found that in some cases the data was corrupted or the experiment was improperly set up. We will present the most interesting data here. First of all, we took a look at the results for North High School with the first algebra experiment. This experiment represented our largest sample size of 133 students. These results are an accumulation of all of North's results with this study over the period of time the experiment was made available to them. In addition, we will look at the results of several smaller experiments from the Number Sense experiments at North High school.

Are students learning with the Assistment Software?

To answer the question of whether students are learning overall with the Assistment software, we run t-tests on the results.

Table 4-1 – One-Sample t-test on Overall Results – Algebra results from North High School

North High

	Sample Size	df	t-value	Mean Gain Score	Variance	p-value
Algebra Experiment 1	133	132	8.690094	0.496241	0.433698	< 0.001

As can be seen from Table 4-1 on one of the Algebra experiments, the sample size is quite large and the mean gain score is also big. Since there are typically only one or two

post-test questions, the sum of the gain scores for a student will generally only be between -2 and 2. We ran a one-sample t-test on the overall gain scores for this experiment testing a null hypothesis that students don't learn at all (an average gain score of 0) Our p-value was extremely low allowing us to reject the null hypothesis and say with confidence that students are learning in this situation.

For that same experiment we looked at the breakdown of how many students got each possible gain score. From Table 4-2, we can see that many students demonstrated learning by our metric, a positive gain score. In fact, summing the percentages of students who got either 1 or 2 for a gain score shows that 45.12% percent of children doing this experiment demonstrated learning.

Table 4-2 - For the data of the first experiment in Algebra at North High, we look at how many students got what gain score.

Algebra Experiment 1 at North

Gain Score	-2	-1	0	1	2	Total
Students	0	3	70	52	8	133
Percent of Total	0.00%	2.26%	52.63%	39.10%	6.02%	100.00%

On the other hand, Table 4-3 shows several experiments in Number Sense that were run at North High School. Experiment 3 is omitted due to an incorrectly configured curriculum. Unfortunately and most probably due to small sample sizes, our p-values are too large for two of the experiments to reject our null hypothesis. For experiment 4, the p-value of .042086 is just under .05 which allows us to reject the null hypothesis with confidence.

Table 4-3 - One-Sample t-test on Overall Results - Number Sense results from North High School

North High

	Sample Size	df	t-value	Mean Gain Score	Variance	p-value (2-tailed)
Number Sense Experiment 1	12	11	1.48324	0.166667	0.151515	0.166087
Number Sense Experiment 2	16	15	1	0.125	0.25	0.33317
Number Sense Experiment 4	20	19	2.179449	0.2	0.168421	0.042086

Shrewsbury High School also had a good portion of data for some of the experiments in our Geometry curriculum. The data is presented in table 4-4 for the first two experiments. Experiment 3 was thrown out as it was incorrectly configured. Experiments 4, 5 and 6 simply did not have a big enough sample size to warrant analysis. The sample size for these two experiments fell between the Number Sense and Algebra experiments we looked at. As with the Algebra experiment, we are able to conclude that students are learning with the Assistment content.

Table 4-4 – One-Sample t-test on Overall Results – Geometry results from Shrewsbury High School

Shrewsbury High School

	Sample Size	df	t-value	Mean Gain Score	Variance	p-value (2-tailed)
Geometry Experiment 1-OVERALL	30	29	4.0975	0.366666667	0.24023	0.000307
Geometry Experiment 2-OVERALL	21	20	2.8284	0.285714286	0.214286	0.010382

Are students learning with hints-only questions? Are students learning with scaffolding questions?

To answer this question, we will do one-sample t-tests on the hint results and scaffolding results individually. We again test against a null hypothesis that neither scaffolding

questions nor hint questions help learning (a mean gain score of 0) Again, for the Algebra experiment we find this p-value to be very low and can reject the null hypothesis strongly. Thus, we are allowed to say that hints and scaffolding do in fact have a positive learning effect.

Table 4-5 - One Sample Test on Hints and Scaffolding Separately for the first Algebra experiment

North High

	Sample Size	df	t-value	Mean Gain Score	Variance	p-value
Algebra Experiment 1 – SCAFFOLDING	64	63	8.690094	0.453125	0.410466	< 0.001
Algebra Experiment 1 – HINTS	69	68	6.580168	0.536232	0.458227	< 0.001

Our results are again less conclusive for the Number Sense curriculum and the small sample sizes. As we look at separate categories, our sample sizes from the overall results are halved. This will make for larger, more inconclusive p-values. And in Table 4-6, we see that the p-values are all greater than .05 and thus we cannot reject the null hypothesis. Thus, we cannot say anything conclusively about whether learning occurred in either hints questions or scaffolding questions for these experiments.

Table 4-6 - One Sample Testing on Hints and Scaffolding Separately for the Number Sense experiments

North High

	Sample Size	df	t-value	Mean Gain Score	Variance	p-value (2-tailed)
Number Sense Experiment 1 - SCAFFOLDING	4	3	1	0.25	0.25	0.391002
Number Sense Experiment 1 – HINTS	8	7	1	0.125	0.125	0.350617

Number Sense Experiment 2 – SCAFFOLDING	6	5	0	0	0.4	1
Number Sense Experiment 2 – HINTS	10	9	1.5	0.2	0.177778	0.167851
Number Sense Experiment 4 – SCAFFOLDING	8	7	1	0.125	0.125	0.350617
Number Sense Experiment 4 – HINTS	12	11	1.914854	0.25	0.204545	0.081864

We performed the same tests on the Geometry results from Shrewsbury High school. The results are in Table 4-7. We are able to conclude that students are learning with hints and scaffolding in Experiment 1. However, we cannot confidently say that students learn with hints in the second experiment, but we can conclude that students are learning with scaffolding questions.

Table 4-7 - One Sample Testing on Hints and Scaffolding Separately for the Geometry experiments at Shrewsbury High School

	Sample Size	df	t-value	Mean Gain Score	Variance	p-value (2-tailed)
Geometry Experiment 1-SCAFFOLDING	15	14	3.0551	0.4	0.257143	0.008564
Geometry Experiment 1-HINTS	15	14	2.6458	0.333333333	0.238095	0.019188
Geometry Experiment 2-SCAFFOLDING	11	10	2.3905	0.363636364	0.254545	0.037929
Geometry Experiment 2-HINTS	10	9	1.5	0.2	0.177778	0.167851

Are scaffolding questions better than hints-only questions?

To answer the question of whether hints-only questions or scaffolding questions are better, we conduct a two-sample comparison of our data. The hints-only samples are compared with the scaffolding samples. We do this for each experiment individually. We test the null hypothesis that the mean gain scores will be equal. Large p-values (greater than 0.05) do not allow us to reject this null hypothesis. Thus, we cannot say conclusively whether one style is better than the other. Tables 4-8, 4-9, and 4-10 show the results from the two-sample t-tests.

Table 4-8 - Two Sample Comparison Assuming Unequal Variances of Hints vs. Scaffolding on the first Algebra experiment at North High

North High

	df	t-value	p-value
Algebra Experiment 1	63	-0.72737	0.468296

Table 4-9 - Two Sample Comparison Assuming Unequal Variances of Hints vs. Scaffolding on the Number Sense experiments at North High

North High

	df	t-value	p-value
Number Sense Experiment 1	5	0.447214	0.673428
Number Sense Experiment 2	8	0.688247	0.510757
Number Sense Experiment 4	17	-0.69156	0.498548

Table 4-10 - Two Sample Comparison Assuming Unequal Variances of Hints vs. Scaffolding on the Number Sense experiments at North High

Shrewsbury High School

	df	t-value	p-value
Geometry Experiment 1	28	0.3669	0.716452
Geometry Experiment 2	19	0.808949	0.428559

Additional Analysis

Our Geometry data at Shrewsbury High School shows an interesting phenomenon. The experiment involved two classes of approximately twenty students each. Each class had fifty minutes to complete the geometry experiment curriculum. After processing the data by removing students who did not complete the experiment and students who aced the conditions, we found that in the first experiment, there was an even distribution of

students who were assigned scaffolding questions and students who were assigned hint questions. However, the second experiment showed a slightly smaller number of students who had done the hint questions. While the third and sixth experiments were not analyzed during the testing of our hypotheses, the data is applicable here. The reason for omitting the third experiment originally was due to a faulty pretest which does not have an impact on students completing the experiment. The sixth experiment was only omitted due to insufficient data.

We speculate that the cause of this phenomenon is that students at Shrewsbury High School who received a hint version took longer to complete the problem. This is based on an observation made by Michael, who administered the experiment. He observed that students who received hints would spend several minutes pondering the hint if they could not easily identify the next step to the question. Students who received scaffolding questions were given a clear direction by the scaffolding question, which allowed them to progress more quickly through the questions. Thus, by culling students who did not finish each experiment, we ended up culling more students who received the hint condition. The following table shows the different between the number of students who completed an experiment based on their condition.

Table 4-11 - For the Geometry curriculum, we looked at the difference in the number of students who completed hints experiments vs. scaffolding experiments

	Sample Sizes					
	Exp. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6
All	30	21	26	11	6	2
Hints (H)	15	9	5	3	3	0
Scaffolds (S)	15	12	21	8	3	2
Ratio S:H	1	1.333333	4.2	2.666667	1	Inf.

This could be explained by the conclusion in a paper by Leena Razzaq, which found that 'honor students', students who performed better on the pretest, would gain more knowledge from hint versions than scaffolding.[7] The students at Shrewsbury High School are relatively strong students with a solid mathematical foundation. If a student is an honor student, scaffolding questions may be exploited as a crutch allowing the student to finish the problem quickly without much thought. The hint versions would force the student to spend more time thinking about the question, resulting in more learning.

With our largest sample, we attempted to reproduce Leena's results for Hints and Scaffolding. We did not run any tests on the delayed response method as she did. Leena's result supported that honors students, which are considered as any student answers any of the pretest questions correctly, will learn better from hints than scaffolding. However, Leena found that students who did not get any pre-test questions correct learned better from scaffold questions. We looked at experiment 1 from the Algebra curriculum at North High to get the following table:

Table 4-12 - Using our North High results for Algebra Experiment 1, we try to reproduce some of Leena's results on Aptitude Treatment interaction

Average of the sum of the Gain Scores	# of Correct Pretest Questions			
Condition	0	1	2	Grand Total
Hints	0.7	0.428571429	0	0.536231884
Scaffolds	0.710526316	0.095238095	0	0.453125
Grand Total	0.705128205	0.261904762	0	0.496240602

The results show that the average gain score for "honors" students (those who score 1 or above on the pretest) learn more from hint questions. This supports Leena's conclusion.

[7] Razzaq, L., Heffernan, N.T. (2007). "What level of tutor interaction is best?" In Luckin & Koedinger (Eds) Proceedings of the 13th Conference on Artificial Intelligence in Education. IOS Press.

However, for non-honors students, Leena concluded that scaffolding would be more beneficial. For this data, we find hints and scaffolding to be nearly equal.

5 Conclusion

Analysis of our data on Algebra from North High, with the large sample size, allows us to conclusively say that the Assistment system, whether employed with hints or scaffolding questions, promotes learning. The data from the Geometry experiments done at Shrewsbury High school also support this claim. Our data did not support any conclusions with respect to the question of whether hints or scaffolding questions were better.

In addition to just the numerical results, other factors need to be considered such as bias in the data. There were at least several unchecked variables in our study that skewed results.

One of the major issues with the data we analyzed was that we were not present to observe or record each and every student that took the study in all cases. This was due to a time constraint issue we could not overcome. A single day per week was our only opportunity to get results over the course of 5 weeks. With a couple of those days being cancelled since the schools did not end up running the study, we were left with very little data that we observed personally.

In addition, the experimental environment was not ideal for obtaining results. While students needed to do their work independently, there were inevitably opportunities where they received outside assistance from a teacher or a peer. This certainly has an impact on the data we collected.

Thirdly, we were noticing that there were more results for hint questions than scaffolding questions. This was simply due to the fact that hints questions are less involved and take less time. Students who solved scaffolding questions may have run out of time for that class and would have been unable to complete the experiment. This nullified their data. This selection effect produced uneven sample sizes making it difficult to analyze the data fairly. For the first experiment in Algebra at North High, we were fortunate to have two nearly equal sample sizes to compare.

Another issue that we had was that some data simply needed to be thrown out all together. This was generally due to incorrectly configured experiments. We encountered instances where pre-test questions did not match post-test questions or there were unequal numbers of pre and post test questions.

For future studies, we suggest that greater care be taken in obtaining results. An adjustment to the experimental environment should be made so that subjects do not gain unequal benefits from their peers. Also, finding extended periods of times that allow subjects to all finish an experiment in time to avoid the selection effect is an appropriate change.

The evidence from the Algebra experimental data from North High is so overwhelmingly in favor of concluding that hint questions and scaffolding questions definitely help students learn that we may be able to overlook the impact the biases have on the results. Further studies will need to be conducted to determine whether scaffolding questions are more effective than hints-only questions for tutoring students.

In addition to our conclusions about the hypotheses we stated earlier, we suggest that more research be done on the amount of time students spend on hint problems vs. scaffolding problems and how learning is affected by the time spent.

Home [FAQ]

Module Worksheet

Logout

Christopher Freeman

You are currently at: **Curriculum Pretty-Print**

Module Name: 10thGradeCPFDone

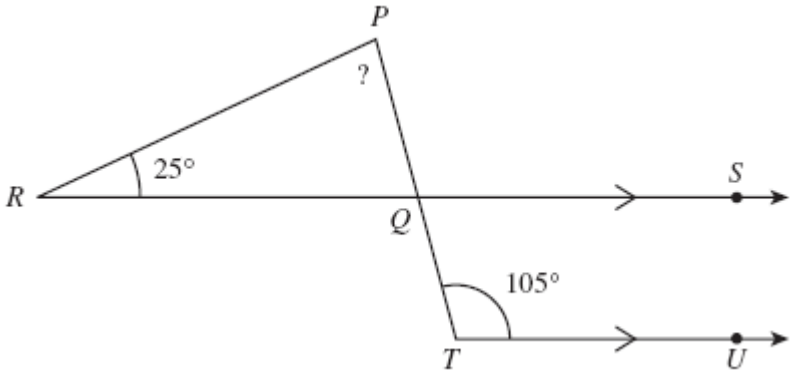
Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Linear Section

1.) "2005_19_gr10_nocalc" (Problem ID: 13148) ALGEBRA_FIELD [MA - 2005 - Spring - 19]

No knowledge components have been assigned



In the figure shown above, RS is parallel to TU, and PT intersects RS at Q.

How many degrees is the angle RPQ?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **80**

(Problem ID: 13150) ALGEBRA_FIELD [MA - 2005 - Spring - 19]

No knowledge components have been assigned

Make your own sketch and put 105? down for the measure of angle PQS that we just found. Now find the measure of angle RQP. (Be sure to mark this on your sketch)

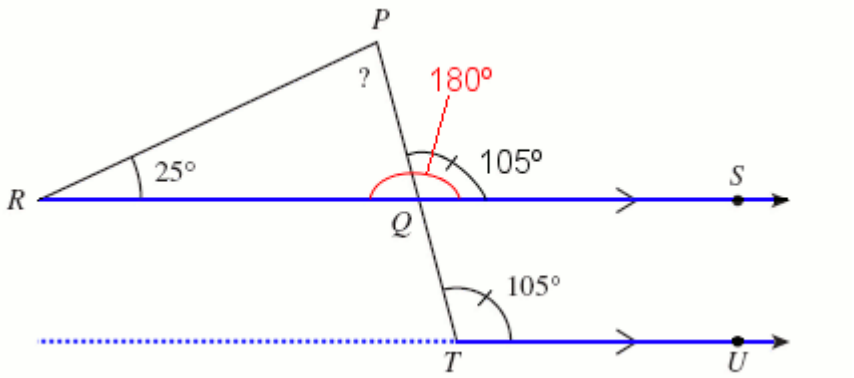
Answers: (Interface Type: ALGEBRA_FIELD)

✓ **75**

Hint 1:

Notice the angle we know and the angle we are looking for are supplementary.

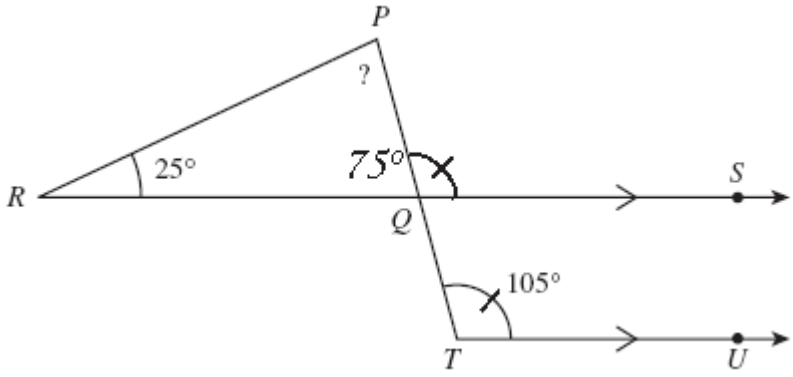
Hint 2:



The angles add up to 180?.
Hint 3:
So, 180-105 = angle RQP
Hint 4:
The correct answer is 75. Please enter 75

(Problem ID: 13151) ALGEBRA_FIELD [MA - 2005 - Spring - 19]

No knowledge components have been assigned



Now we know 2 angles of a triangle, and we are looking for the third one, this will be the answer to the problem. What is the measure of this angle?

Answers: (Interface Type: ALGEBRA_FIELD)

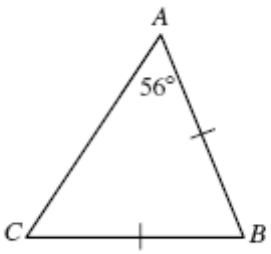
✔ **80**

Hint 1:
The sum of the interior angles of a triangle is equal to 180.
Hint 2:
That is: 75 + 25 + ? = 180
Hint 3:
So, 100 + ? = 180

Find the missing value.
Hint 4:
The correct answer is '80'. Please enter '80'

2.) "2004_36_gr10" (Problem ID: 12516) RADIO_BUTTON [MA - 2004 - Spring - 36]

No knowledge components have been assigned



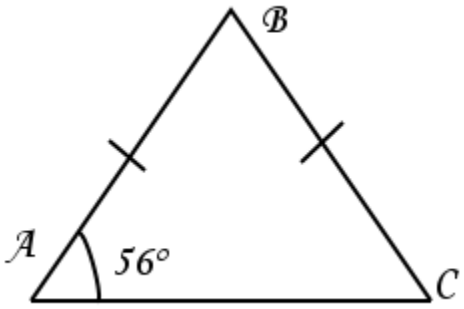
What is the measure of angle B in the figure shown above?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 34
✗ B. 56
✗ C. 62
✓ **D. 68**

(Problem ID: 12517) ALGEBRA_FIELD [MA - 2004 - Spring - 36]

No knowledge components have been assigned

Because of the single dash on sides AB and BC, we know that they are congruent. We can say something about angle C as a result. What is the measure of angle C?
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **56**

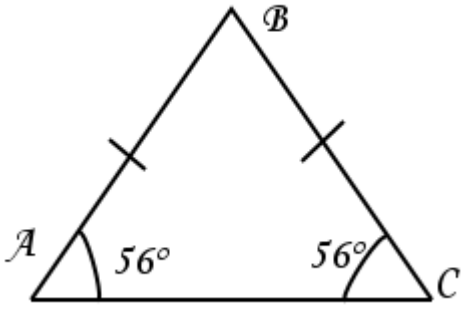
Hint 1:



It might help to look at the triangle this way. (Note: It is isoceles)
Hint 2:
The measure of angle C is equal to the measure of angle A
Hint 3:
The correct answer is '56'. Please enter '56'

(Problem ID: 12518) ALGEBRA_FIELD [MA - 2004 - Spring - 36]

No knowledge components have been assigned



Now that we know angle C, we can use what we know about angles of a triangle to find B.

Find B
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **68**

Hint 1:
The sum of the angles of a triangle are 180?
Hint 2:
Solve for 56 + 56 + B = 180. What is B?
Hint 3:
The correct answer is '68'. Please enter/select '68' (without quotes).

3.) "2004_26_gr10" (Problem ID: 12513) RADIO_BUTTON [MA - 2004 - Spring - 26]

No knowledge components have been assigned

A. $y = \frac{1}{4}x - 1$

B. $y = \frac{1}{4}x + 21$

C. $-2x + 4y - 8 = 0$

D. $-x + 4y + 8 = 0$

Which of the above is an equation for a line that is not parallel to the line with the following equation?

-x + 4y - 8 = 0
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✓ **C**
✗ D

(Problem ID: 12514) ALGEBRA_FIELD [MA - 2004 - Spring - 26]

No knowledge components have been assigned

For two lines to be parallel their slopes must be equal.

What is the slope of the equation **-x +4y - 8 = 0**

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **1/4**

Hint 1:
It may be helpful to put the equation into the form y = mx + b where m is the slope and b is the y-intercept.

Hint 2:
Solve for y. That is, get y to one side of the equation by itself. Then, the coefficient of x will be the slope.

Hint 3:
Start by adding 8 to both sides of the equation.

-x + 4y - 8 = 0
-x + 4y = 8

Hint 4:
Next, add x to both sides.

-x + 4y - 8 = 0
-x + 4y = 8
x - x + 4y = x + 8
4y = x + 8

Hint 5:
Now divide both sides by 4.

-x + 4y - 8 = 0
-x + 4y = 8
4y = x + 8
y = (1/4)x + 2

Hint 6:
Now we have the coefficient of x, which is also the slope.

Hint 7:
The correct answer is 1/4. Please enter 1/4

(Problem ID: 12515) RADIO_BUTTON [MA - 2004 - Spring - 26]

No knowledge components have been assigned

A. $y = \frac{1}{4}x - 1$

B. $y = \frac{1}{4}x + 21$

C. $-2x + 4y - 8 = 0$

D. $-x + 4y + 8 = 0$

Now find the slopes of the different choices. Which equation does not have 1/4 as its slope. Remember, we now know the equation of the line -x + 4y - 8 = 0 is equivalent to y = (1/4)x + 2

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:
We can eliminate both A and B since they both are in the form y = mx + b and we can plainly see that their slopes are both 1/4

Hint 2:
For C and D you must solve for y and look at the coefficient of x.

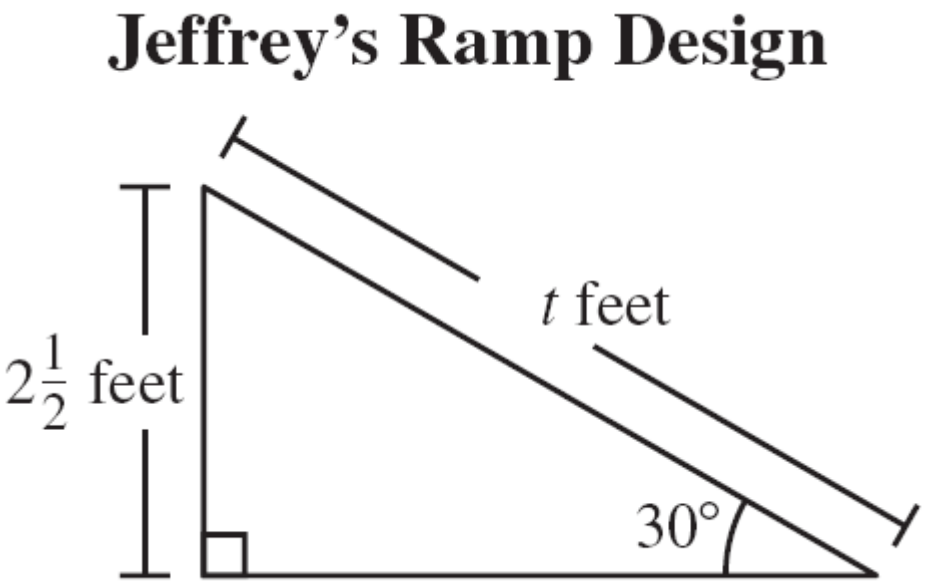
Hint 3:
You should have this work on your paper, but we can see that for C when we solve for the slope, it won't be equal to 1/4.

-2x + 4 - 8 = 0
-2x + 4y = 8
4y = 8 + 2x
y = 2 + 2/4x
y = 2 + 1/2x

Hint 4:
The correct answer is 'C'. Please select 'C'

4.) "2006_16_gr10_nocalc" (Problem ID: 13688) TEXT_FIELD [MA - 2006 - SPRING - 16]

No knowledge components have been assigned



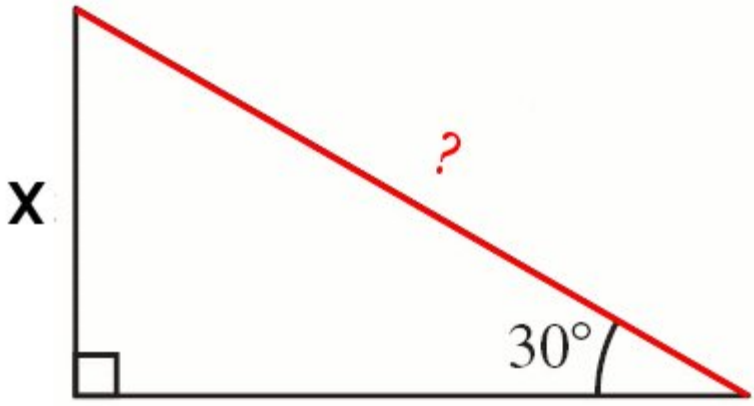
Jeffrey wants to build a ramp to make it easier to load his lawn mower into the back of his truck. He drew the diagram above to help him design the ramp. What is t, the length in feet of the ramp?

Answers: (Interface Type: TEXT_FIELD)

✔ **5**

(Problem ID: 13689) RADIO_BUTTON [MA - 2006 - SPRING - 16]

No knowledge components have been assigned



The triangle given is a special right triangle. If the short leg of a 30, 60, 90 triangle is **x**, what is the length of the hypotenuse (shown in red)?

Answers: (Interface Type: RADIO_BUTTON)

✘ 3x/2

✔ **2x**

✘ x^2

✘ x

Hint 1:

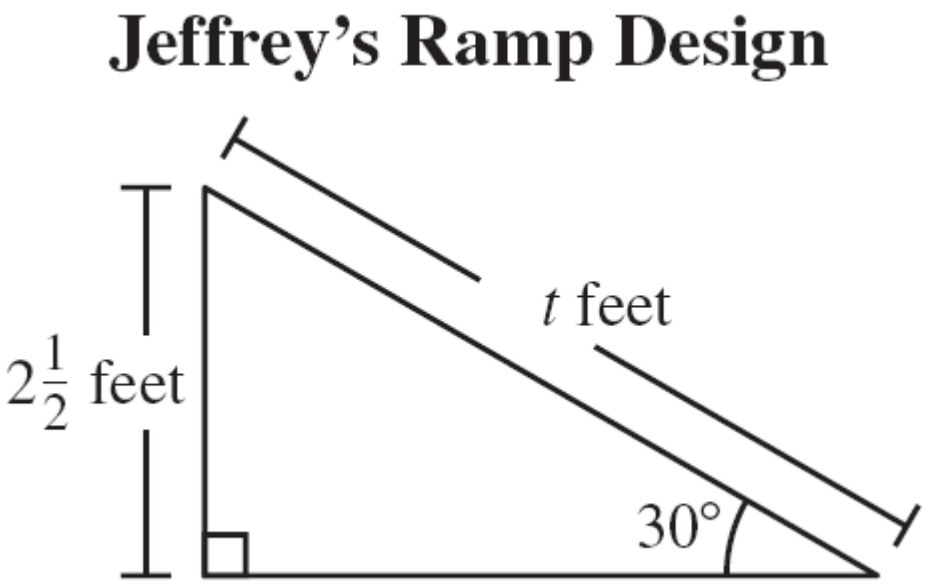
Look at your reference sheet for the properties of a 30, 60, 90 triangle

Hint 2:

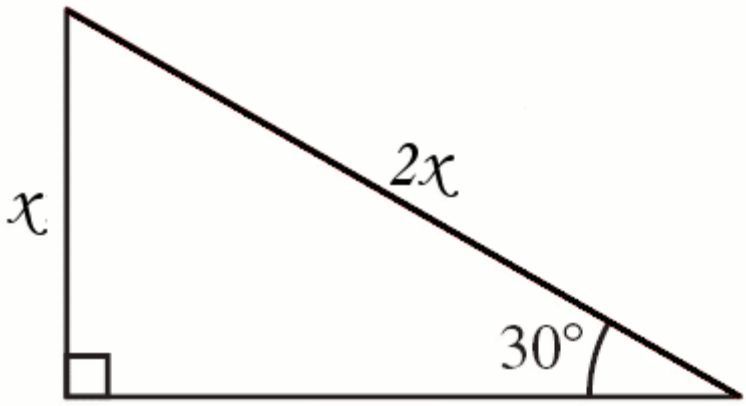
The hypotenuse would be 2x.

Hint 3:
The correct answer is 2x. Please select 2x

(Problem ID: 13690) TEXT_FIELD [MA - 2006 - SPRING - 16]
No knowledge components have been assigned



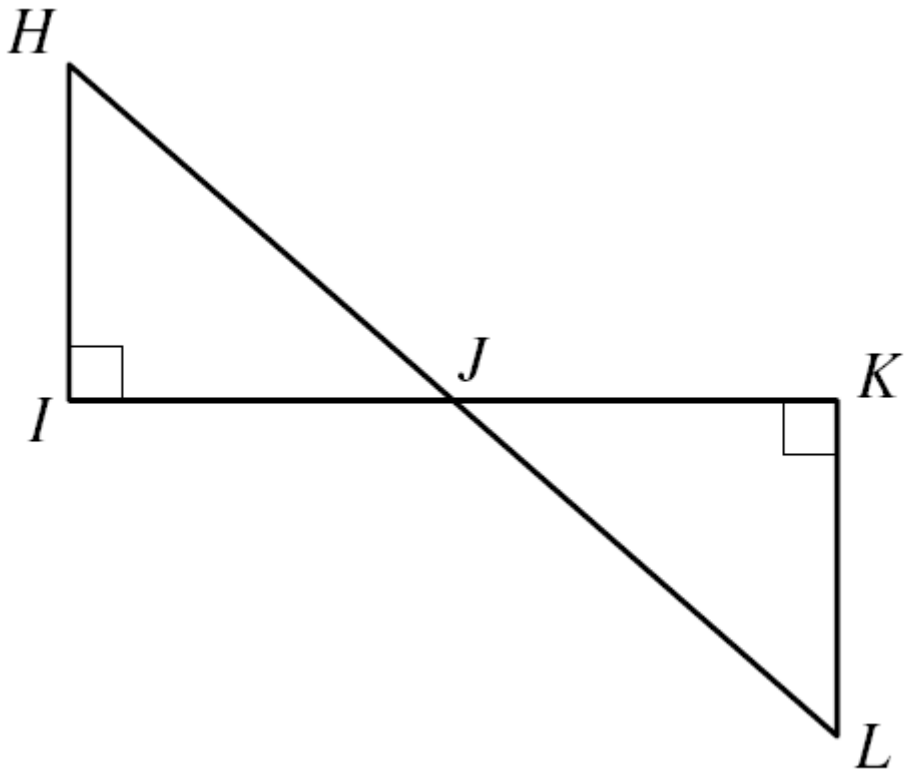
Use this relationship to find the length of t. (We know the short leg of the 30, 60, 90 triangle to be 2.5 feet.)
Answers: (Interface Type: TEXT_FIELD)
✔ **5**
Hint 1:



Because of the property we discussed in the previous problem, the hypotenuse is twice as long as the short leg.
Hint 2:
2*2.5 = 5
Hint 3:
The correct answer is '5'. Please enter '5'

5.) "2005Nov_05_gr10_nocalc" (Problem ID: 13685) RADIO_BUTTON [MA - 2005 - NOV - 5]

No knowledge components have been assigned



In the figure above, triangle HIJ is congruent to triangle LKJ. If the measure of angle L is 50 degrees, what is the measure of angle IJH?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 35
✓ **B. 40**
✗ C. 45
✗ D. 50

(Problem ID: 13686) RADIO_BUTTON [MA - 2005 - NOV - 5]

No knowledge components have been assigned

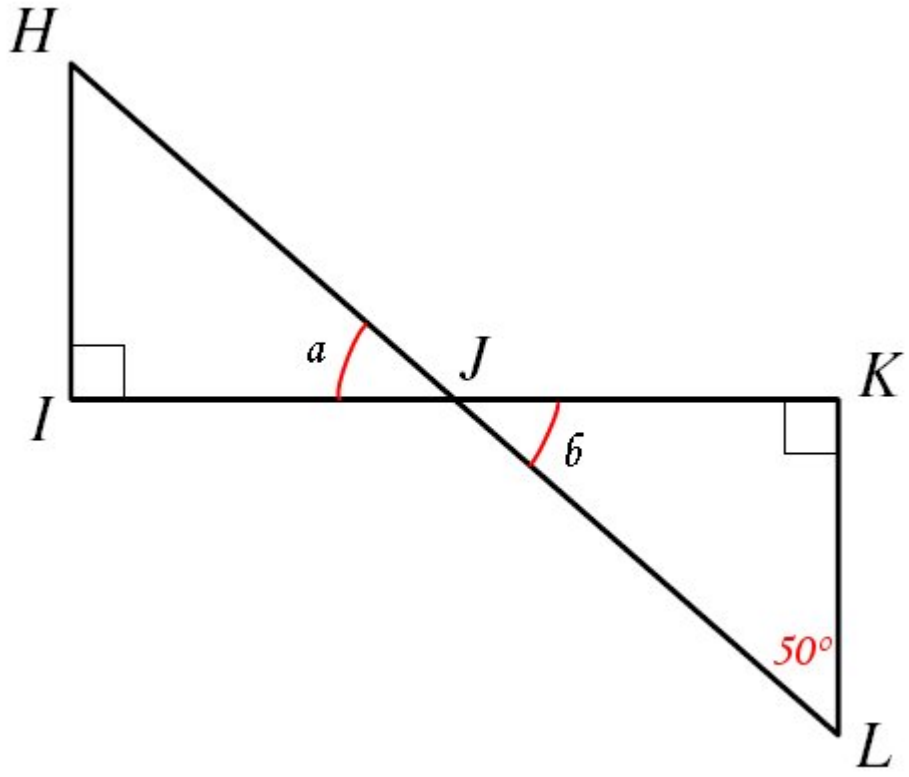
First, it always helps to draw a sketch. Draw the original picture and mark what you know from the problem and mark what you are looking for.

What is the best way to describe the way in which angles IJH (let's call it a) and KJL (let's call it b) relate?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. Vertical angles**
✗ B. Complementary
✗ C. Supplementary
✗ D. Horizontal angles
✗ E. Perpendicular

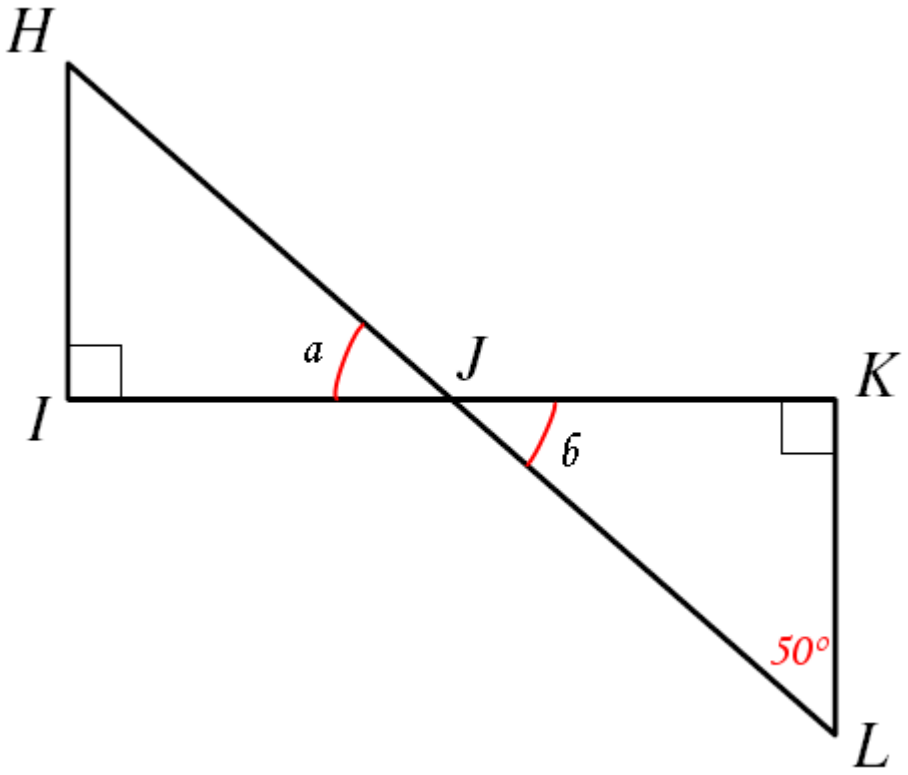
Hint 1:



These angles are equal, but what concept suggests this?
Hint 2:
If two angles are opposite each other where two lines intersect, they are called "vertical angles"
Hint 3:
The correct answer is Vertical angles. Please select Vertical angles.

(Problem ID: 13687) TEXT_FIELD [MA - 2005 - NOV - 5]

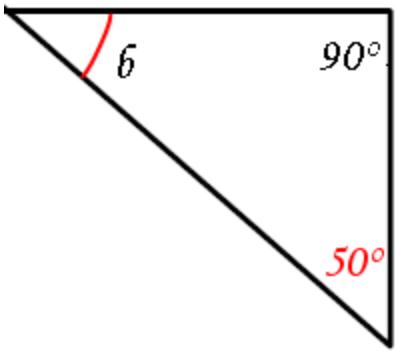
No knowledge components have been assigned



Now we know and b are vertical angles and since vertical angles are congruent, we can determine a if we know b.

How many degrees is the measure of angle b?
Answers: (Interface Type: TEXT_FIELD)
✓ **40**

Hint 1:

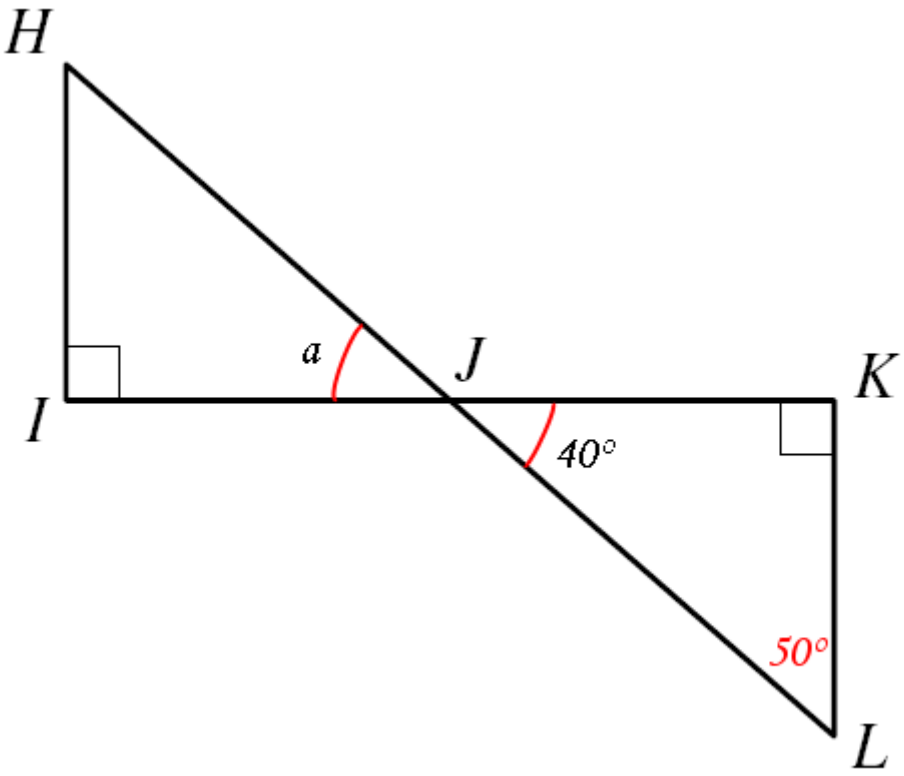


Angle b forms a triangle with angle K (a right angle) and angle L (which is 50 degrees)

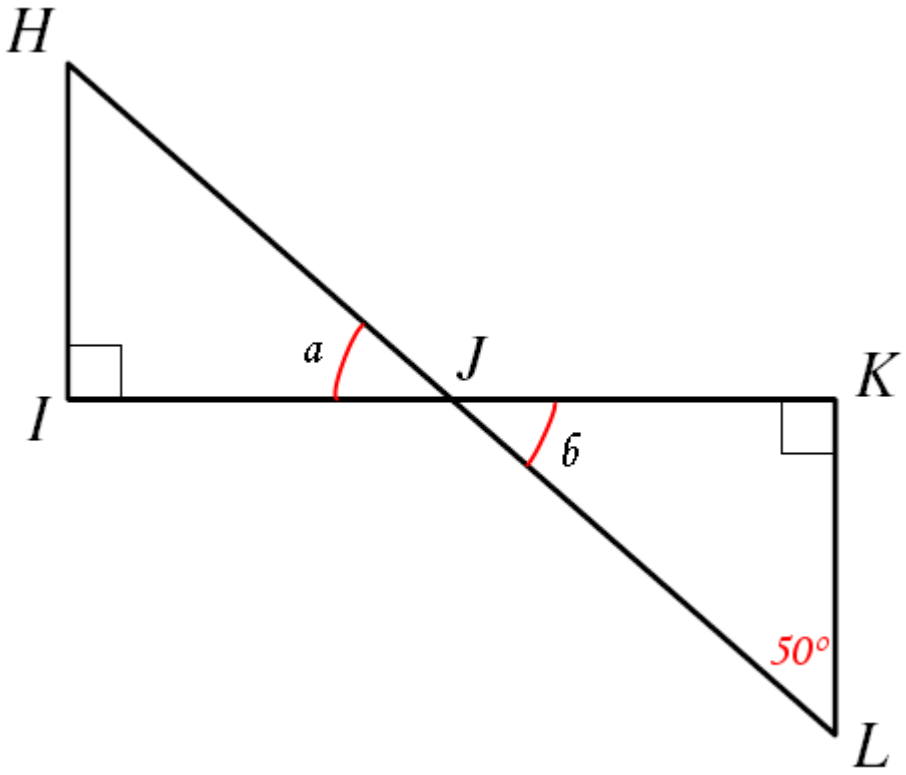
Use what you know about the angles of a triangle to find b. (see picture above)
Hint 2:
The sum of the interior angles of a triangle is 180.

Hint 3:
Solve 90 + 50 + b = 180 for **b**.
Hint 4:
b = 180 - 90 - 50 = 40. The answer is 40?. Please enter 40

(Problem ID: 13867) RADIO_BUTTON [MA - 2005 - NOV - 5]
No knowledge components have been assigned



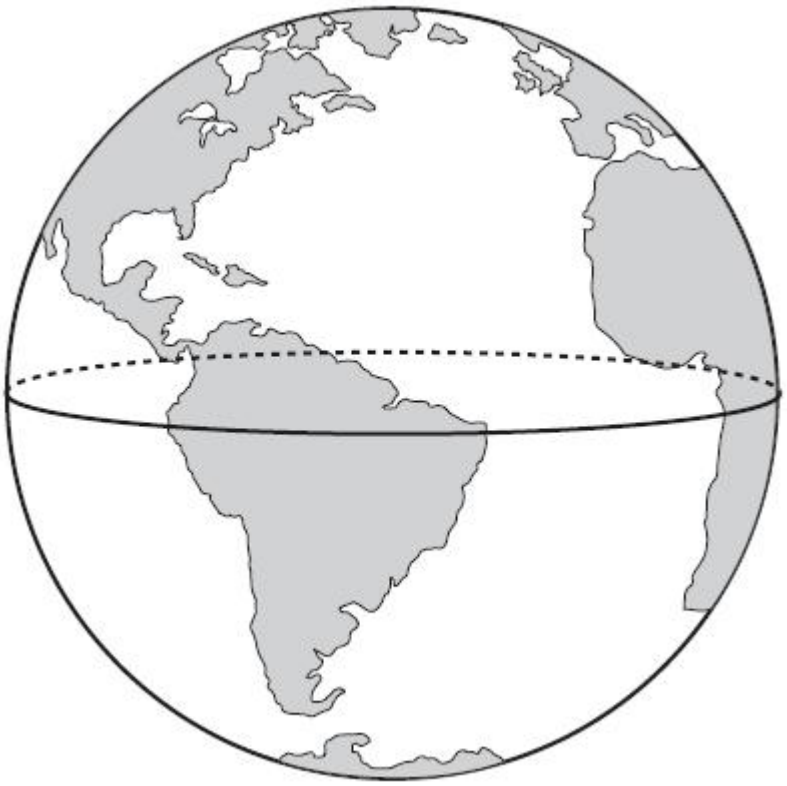
Let's go back to the original question now with all of this information in mind. What is the measure of angle IJH? (denoted as a in the sketch above)
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 35
✓ **B. 40**
✗ C. 45
✗ D. 50
Hint 1:



Remember that we found out a and b are vertical angles which means they are equal. We found the measure of angle b to be 40?
Hint 2:
The correct answer is 40?. Please enter 40

6.) "2005_27_gr10_calc" (Problem ID: 13868) RADIO_BUTTON [MA - 2005 - Spring - 27]

No knowledge components have been assigned



Tiffany wants to calculate the volume of her globe. The globe is in the shape of a sphere, as represented by the picture below. She measures the circumference of the globe along the equator to be 24 inches.

Which of the following measures is closest to the volume of Tiffany's globe?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 46 cubic inches
✗ B. 61 cubic inches
✗ C. 183 cubic inches
✓ **D. 234 cubic inches**

(Problem ID: 13869) RADIO_BUTTON [MA - 2005 - Spring - 27]
No knowledge components have been assigned

$$V = \frac{4}{3}\pi * r^3$$

Refer to your reference sheet for the volume of a sphere. The formula is shown above. In order to calculate the volume of the sphere, we will need to find the radius.

Find r.
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 4
✗ B. $12^2/\pi$
✗ C. $144\pi^2$

✓ **D. 12/π**

Hint 1:
Remember that we know the circumference is 24 inches.
Hint 2:
Refer to your reference sheet for the formula for the circumference of a sphere (which is the same as the circumference of a circle)

The formula is:
C = 2πr
Hint 3:
The circumference is 24. Substitute it into the formula for the cimcumference:
24 = 2πr

And now simplify:
24/(2π) = r
12/π = r
Hint 4:
The radius of the circle is 12/π Please select D.

(Problem ID: 13870) RADIO_BUTTON [MA - 2005 - Spring - 27]
No knowledge components have been assigned

$$V = \frac{4}{3}\pi * r^3$$

Now that we know the radius of the sphere is 12/π, let's substitute that into the formula for the volume of a sphere which is stated again above. Solve for the volume.
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 46 cubic inches
✗ B. 61 cubic inches
✗ C. 183 cubic inches
✓ **D. 234 cubic inches**

Hint 1:

$$V = \frac{4}{3}\pi * r^3$$

$$V = \frac{4}{3}\pi * \left(\frac{12}{\pi}\right)^3$$

As shown above, substitute in our known value of the radius for r.
Hint 2:

$$V = \frac{4}{3}\pi * r^3$$

$$V = \frac{4}{3}\pi * \left(\frac{12}{\pi}\right)^3$$

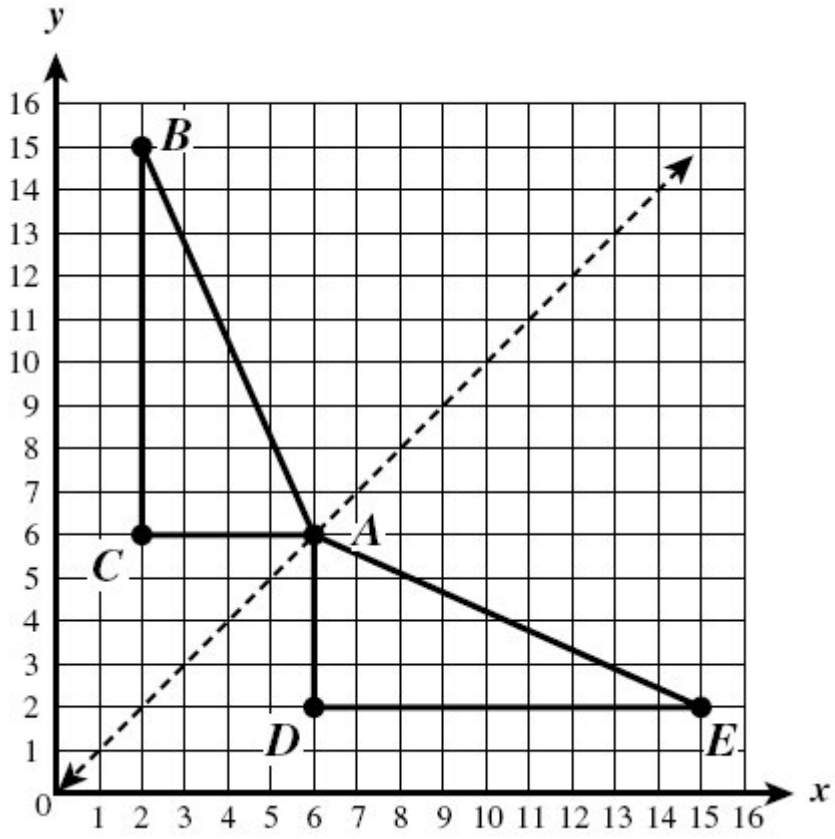
$$V = \frac{4 * \pi * 12 * 12 * 12}{3 * \pi * \pi * \pi}$$

$$V \approx 233.444$$

Next, simplify the expression so that you can easily use your calculator to compute the answer (as shown above)
Hint 3:
The answers we can choose from are not exact, so we must pick the one that is closest to our computed value.
Hint 4:
The volume of the sphere with circumference 24 is about 234. Select D.

7.) "2005n_2_gr10_nocalc" (Problem ID: 14102) RADIO_BUTTON

No knowledge components have been assigned



Right triangles ABC and AED are shown on the coordinate grid below. Which single transformation, with respect to the line y = x, maps ABC to AED?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. dilation *Dilations are changes in size and are not done with respect to a line.*

✓ **B. reflection**

✗ C. rotation *Rotations on the xy plane are done with respect to a point, not a line.*

✗ D. translation *Translations are shifts up and down and to the left and right. They are not with respect to a line.*

Hint 1:

In the xy-plane, only one of the transformations listed is done with respect to a line.

Hint 2:

A reflection is done with respect to a line. Here, the triangles make a reflection across the y = x line.

Hint 3:

The answer is reflection. Choose answer choice B

8.) "2006_18_gr10_nocalc" (Problem ID: 13904) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

The volume of Anand's cube is 8 cubic centimeters. What is the total surface area, in square centimeters, of his cube?

Answers: (Interface Type: TEXT_FIELD)

✓ **24**

(Problem ID: 13905) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

In order to find the surface area, we must first find the lengths of the edges. Therefore, we must use the volume of the cube to determine the length of the edge.

Refer to your reference sheet for the formula for the volume of a cube, which we know, in terms of the length of the edges.

What is the length of one edge of this cube?

Answers: (Interface Type: TEXT_FIELD)

✓ **2**

Hint 1:
The volume of a cube is:
$V = s^3$
Hint 2:
Substitute in the value of the volume:
$8 = s^3$
Hint 3:
Take the cube root of both sides:
$2 = s$
Hint 4:
The length of an edge of the cube is 2. Please enter 2.

(Problem ID: 13906) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

Now that we know the length of an edge, 2, use the formula for the total surface area of the cube. Compute the total surface area.

Answers: (Interface Type: TEXT_FIELD)

✓ **24**

Hint 1:
The formula for the total surface area of a cube is:
$SA = 6s^2$

Substitute in the value, 2, for the length of an edge:
$SA = 6*2^2$

Hint 2:
Simplify:
$SA = 24$
Hint 3:
The surface area of the cube is 24. Please enter 24.

9.) "2005_25_gr10_calc" (Problem ID: 13145) RADIO_BUTTON [MA - 2005 - Spring - 25]

No knowledge components have been assigned

AB has one endpoint at A(2,5) and its midpoint is at (4,0) What are the coordinates of B, the other endpoint of AB?

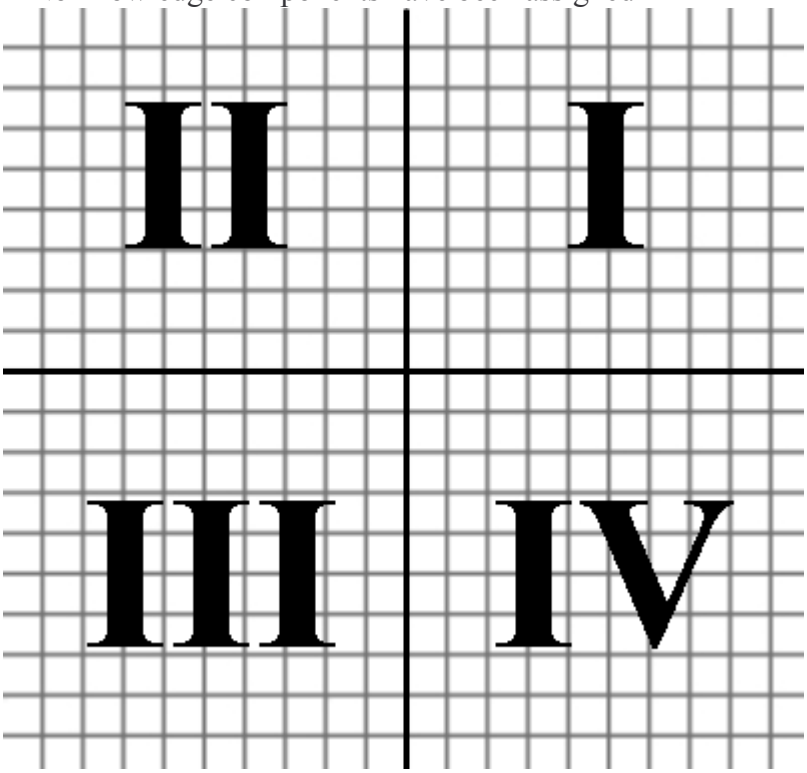
Answers: (Interface Type: RADIO_BUTTON)

✗ A. (2, -5)

✗ B. (3, 2.5)
✓ **C. (6, -5)**
✗ D. (6, 2.5)

(Problem ID: 13146) RADIO_BUTTON [MA - 2005 - Spring - 25]

No knowledge components have been assigned

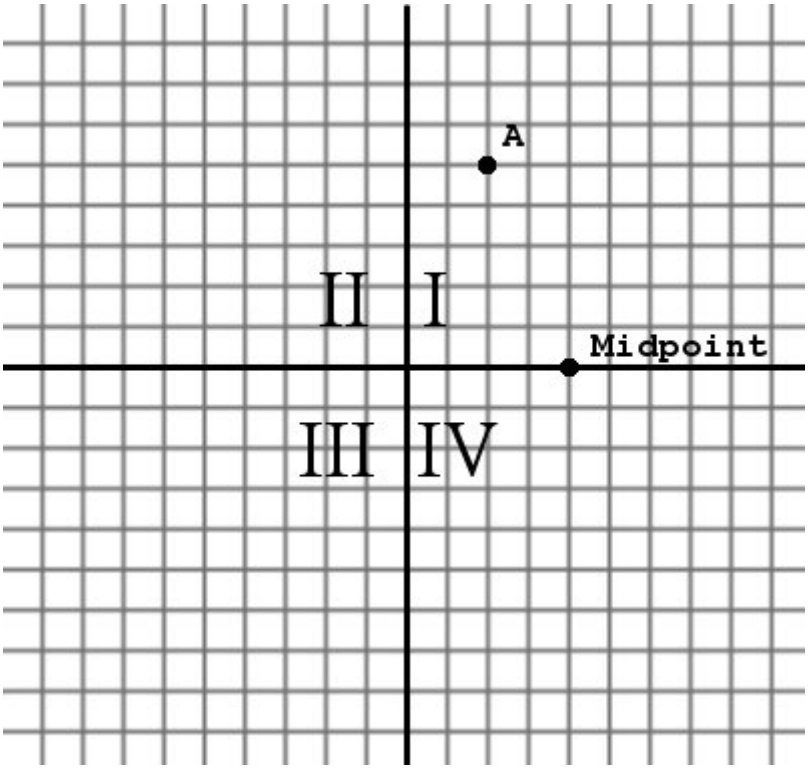


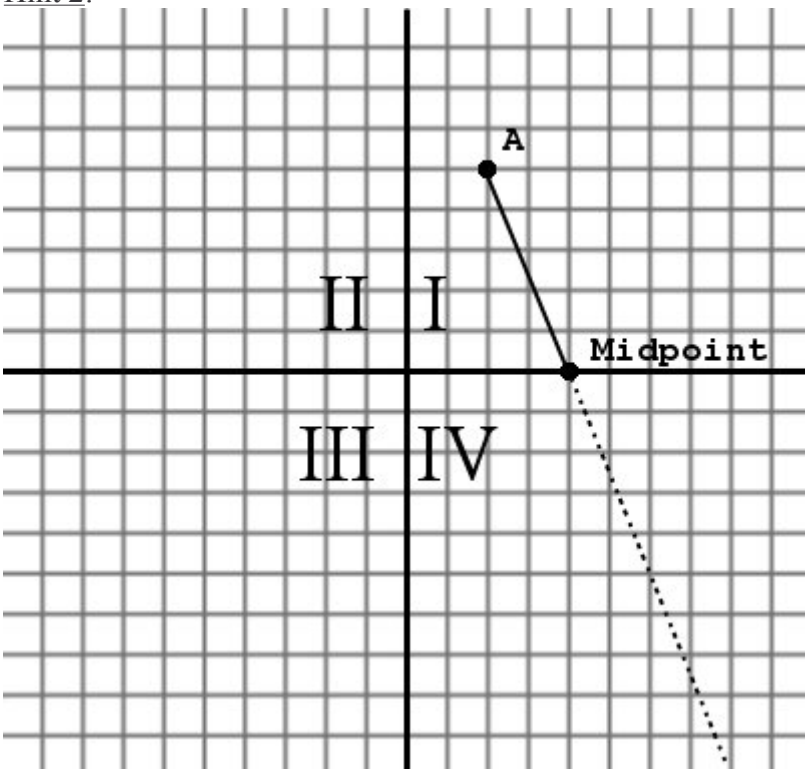
On your scrap paper, sketch out a coordinate plane and plot point A and the midpoint. In what quadrant should the point B, the other endpoint of AB, be located?

Answers: (Interface Type: RADIO_BUTTON)

✗ I
✗ II
✗ III
✓ **IV**

Hint 1:



Here is a sketch of the coordinate plane.
Hint 2:


The point A is the start of a line segment that passes through the midpoint. From there, the line will travel the same distance and in the same line as A and the midpoint to get to B.
Hint 3:
B is on the dotted line so it is in quadrant IV. Select IV

(Problem ID: 13147) RADIO_BUTTON [MA - 2005 - Spring - 25]

No knowledge components have been assigned

Now try to figure out how far in the x and y directions the line segment from A has to go to get to the midpoint. From the midpoint, travel those same distances in the x and y directions to arrive at the endpoint.

Answers: (Interface Type: RADIO_BUTTON)

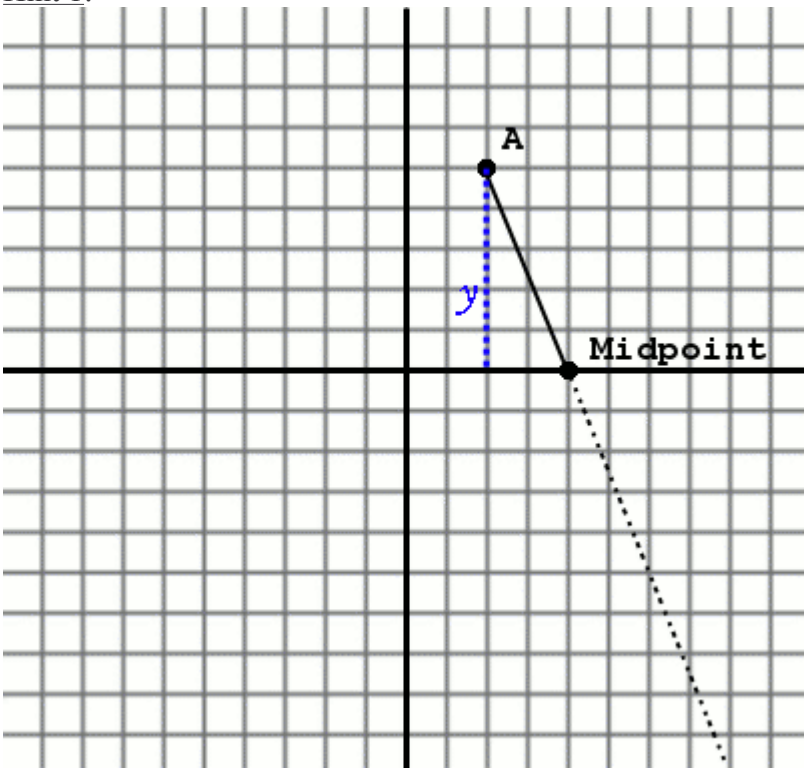
✓ **C. (6, -5)**

✗ A. (2, -5)

✗ D. (6, 2.5)

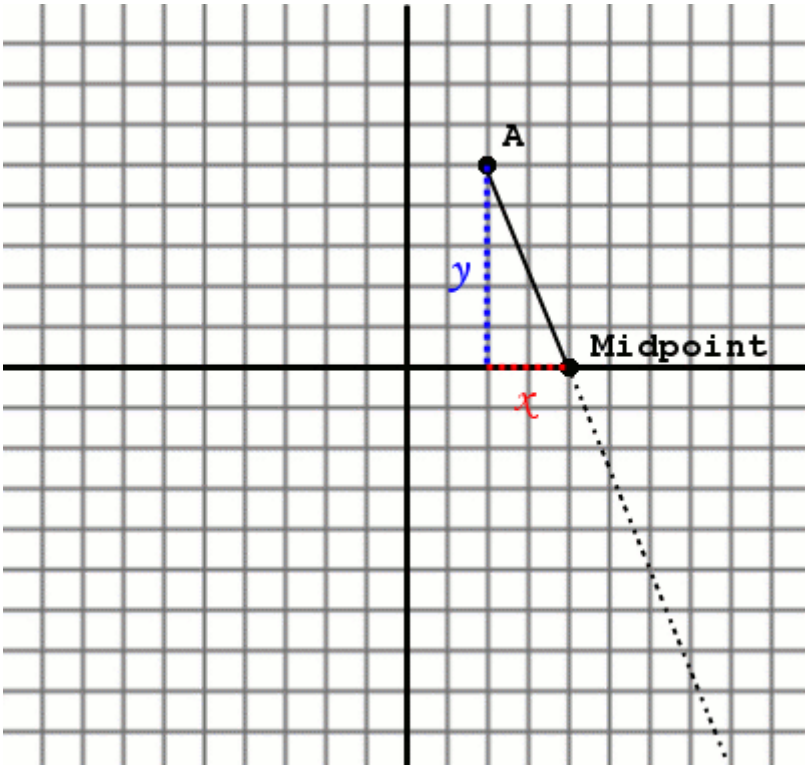
✗ B. (3, 2.5)

Hint 1:



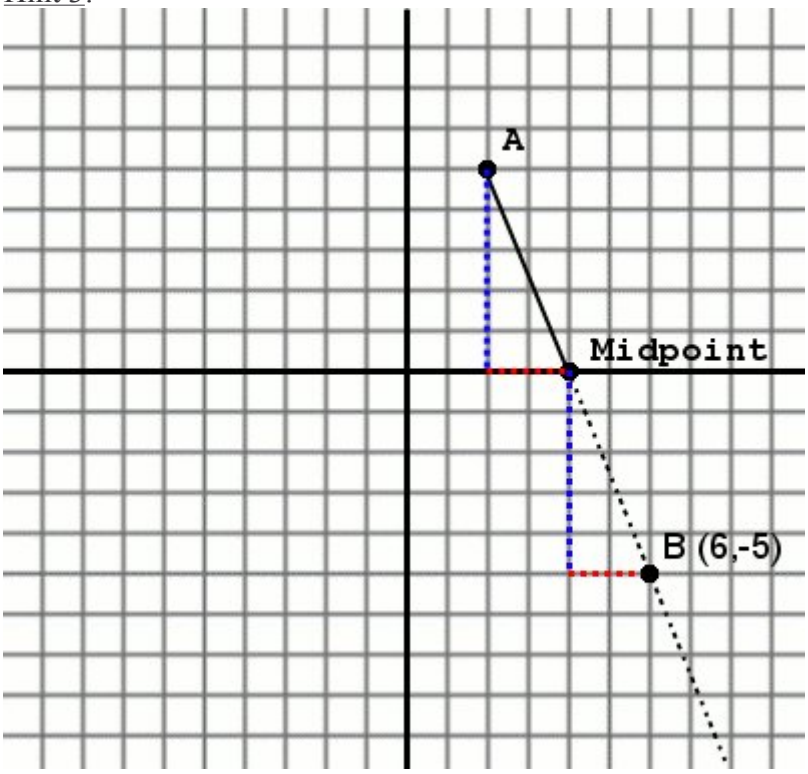
The difference in the x direction between A and the midpoint is 2.

Hint 2:



The difference in the y direction between A and the midpoint is 5.

Hint 3:



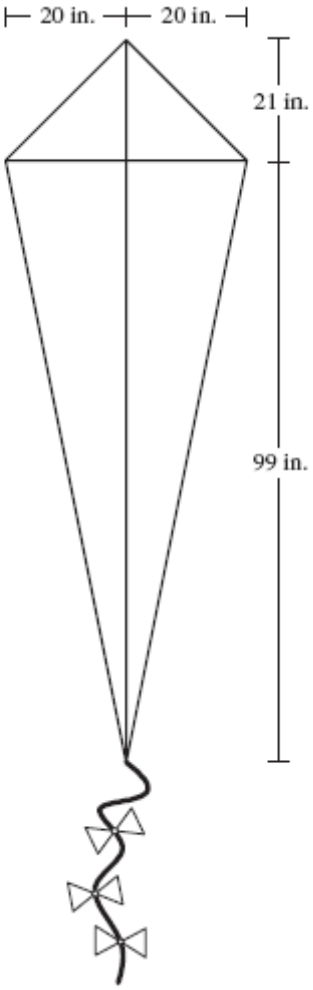
Go down 5 from the midpoint and to the right by 2.

Hint 4:

The answer is (6,-5)

10.) "2005_32_gr10_calc" (Problem ID: 13158) ALGEBRA_FIELD [MA - 2005 - Spring - 32]

No knowledge components have been assigned



A kite has perpendicular diagonals with the measures shown in the drawing above.

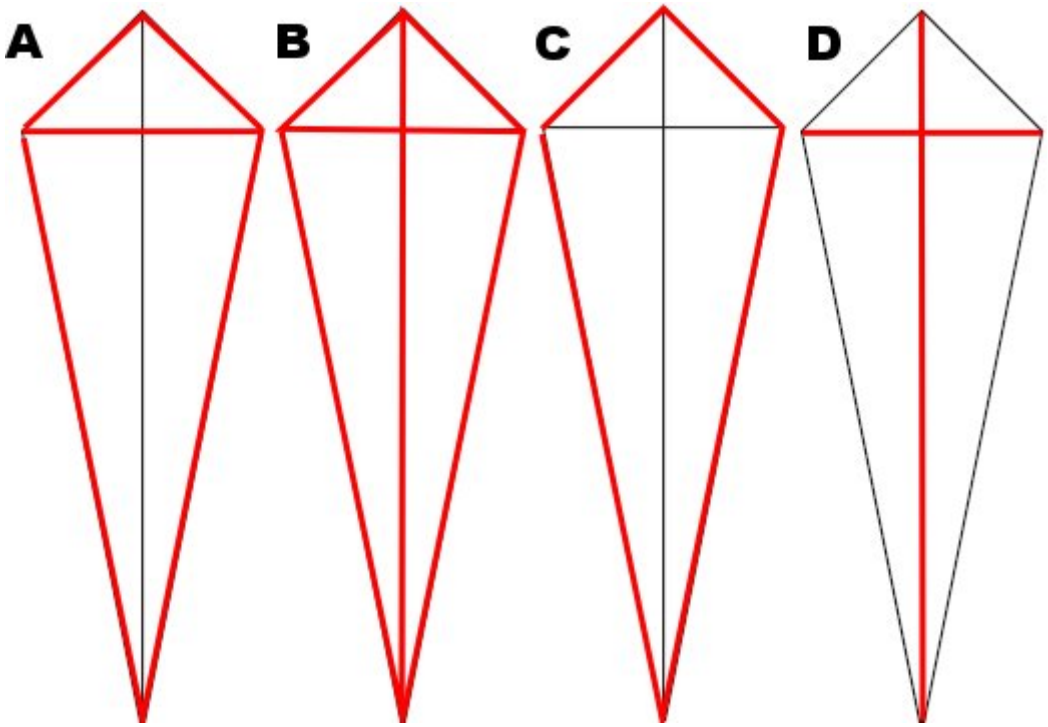
What is the perimeter, in inches of the kite?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **260**

(Problem ID: 13159) RADIO_BUTTON [MA - 2005 - Spring - 32]

No knowledge components have been assigned



Let's start by making sure you understand what the perimeter is. In which of the above kites is the red portion the perimeter?

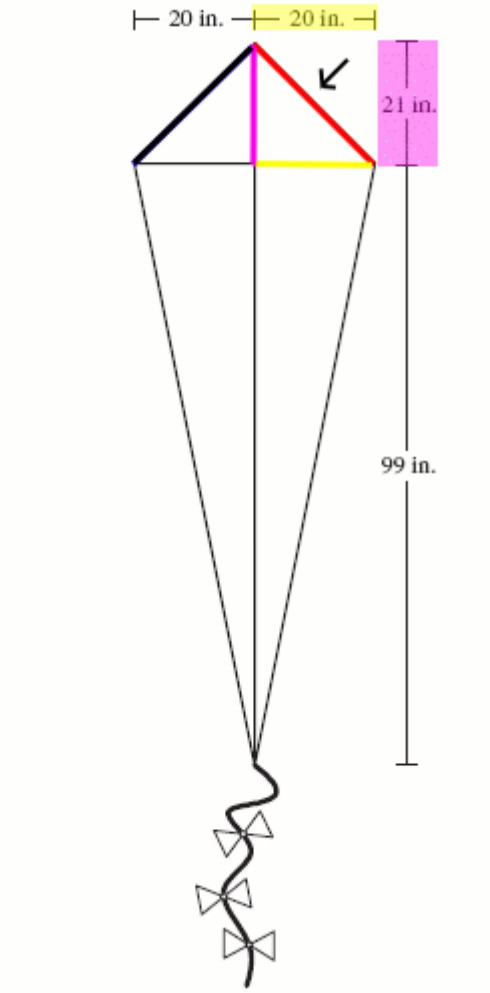
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:
The perimeter is the sum of the lengths of all of the outside edges or curves of a figure.
Hint 2:
The correct answer is 'C'. Please select 'C'

(Problem ID: 13610) TEXT_FIELD [MA - 2005 - Spring - 32]

No knowledge components have been assigned



Now let's actually find the lengths of the line segments of the perimeter. Start with the line segment shaded in red.

Answers: (Interface Type: TEXT_FIELD)

✓ **29**

Hint 1:

This line segment is the hypotenuse of a right triangle. We can see that the legs of this triangle are given in the diagram. One of them being 20 and the other being 21 inches. What is the value of the hypotenuse for this triangle?

Hint 2:

$$a^2 + b^2 = c^2$$

The formula for the lengths of the sides of a right triangle is shown above. *a* and *b* are the legs and *c* is the the hypotenuse.

Hint 3:

Substitute in the values of the legs where a = 20 and b = 21. Now solve for c.

Hint 4:

$$a^2 + b^2 = c^2$$

$$20^2 + 21^2 = c^2$$

$$400 + 441 = c^2$$

$$841 = c^2$$

Follow the steps above and then solve for c.

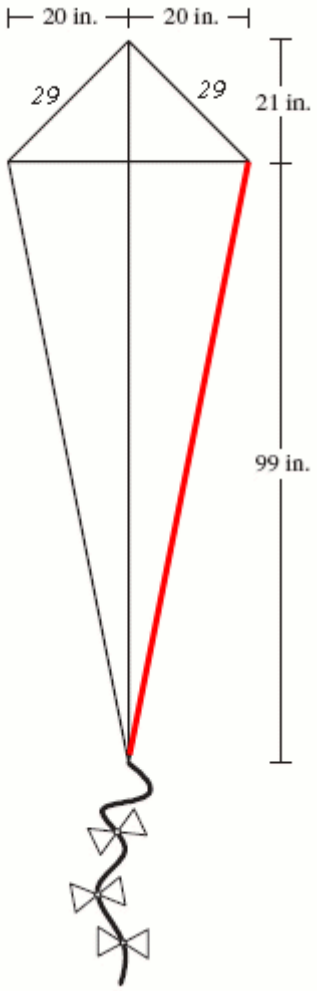
To do this on your own you should write the above work on your paper.
Hint 5:

$$\sqrt{841} = \sqrt{c^2}$$

$$29 = c$$

Take the square root of both sides and you will find the solution as seen above.
Hint 6:
The correct answer is 29. Please enter 29

(Problem ID: 13611) TEXT_FIELD [MA - 2005 - Spring - 32]
No knowledge components have been assigned



Now we know two lengths in the perimeter. Let's find the others. In order to find the length of the new line segment shaded in red, follow the same procedure from the previous problem. What is the length of the red segment?

Answers: (Interface Type: TEXT_FIELD)

✔ **101**

Hint 1:

This line segment is the hypotenuse of a right triangle. We can see that the legs of this triangle are given in the diagram. One of them being 20 and the other being 21 inches. What is the value of the hypotenuse for this triangle?

Hint 2:

$$a^2 + b^2 = c^2$$

The formula for the lengths of the sides of a right triangle is shown above. *a* and *b* are the legs and *c* is the the hypotenuse. Solve for c.

Hint 3:

Substitute in the values of the legs (20 and 99) and solve for c.

Hint 4:

$$a^2 + b^2 = c^2$$

$$20^2 + 99^2 = c^2$$

$$400 + 9801 = c^2$$

$$10201 = c^2$$

Follow the steps above and then solve for c.

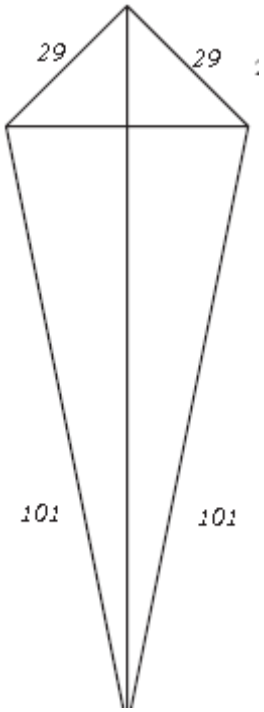
To do this on your own you should write the above work on your paper.
Hint 5:

$$\sqrt{10201} = \sqrt{c^2}$$

$$101 = c$$

Take the square root of both sides and you will find the solution as seen above.
Hint 6:
The correct answer is 101. Please enter 101

(Problem ID: 13615) TEXT_FIELD [MA - 2005 - Spring - 32]
No knowledge components have been assigned



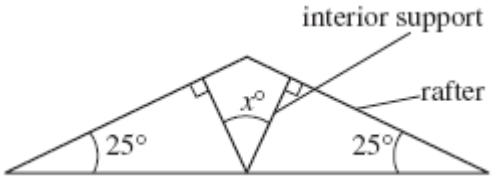
Now add up the values of the edges of the kite. What is the perimeter?
Answers: (Interface Type: TEXT_FIELD)
✔ **260**

Hint 1:
We calculated two of the line segments that make up the perimeter. In fact, each one is symmetric with one on the other side of the kite. So we will count each of those line

segments twice.
Hint 2:
Add 101 + 101 + 29 + 29
Hint 3:
101 + 101 + 29 + 29 = 260. Please enter 260

11.) "2005_38_gr10_calc" (Problem ID: 13617) RADIO_BUTTON [MA - 2005 - Spring - 38]

No knowledge components have been assigned



Each of the two interior supports for part of a roof is perpendicular to a rafter, as shown above.

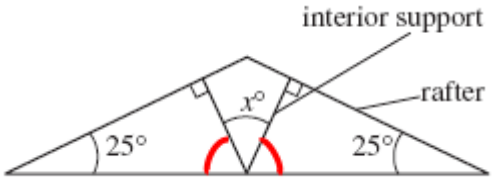
Find x.

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 50**
✗ B. 65
✗ C. 90
✗ D. 130

(Problem ID: 13627) TEXT_FIELD [MA - 2005 - Spring - 38]

No knowledge components have been assigned

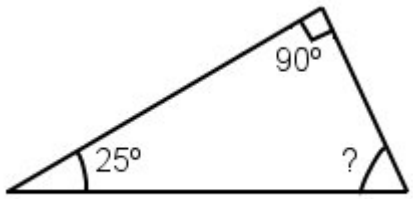


To find x, it will be helpful to know the angles in red. Make a sketch so you can put in the new information as you get it. Find the measure of one of these angles (they will be equal due to symmetry)

Answers: (Interface Type: TEXT_FIELD)

✓ **65**

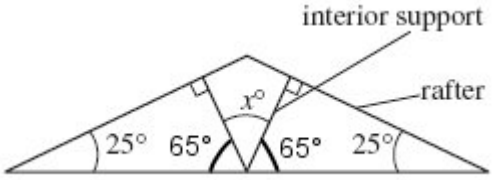
Hint 1:



These angles are part of a triangle for which the other two angles are known. Remember that a right angle is 90?
Hint 2:
The sum of the interior angles of a triangle is 180.
Hint 3:
90 + 25 + ? = 180
Hint 4:
The correct answer is 65. Please enter 65

(Problem ID: 13628) RADIO_BUTTON [MA - 2005 - Spring - 38]

No knowledge components have been assigned



Now that the measure of those angles are known to each be 65 (label them on your sheet), we should be able to find out what x is. Find x.

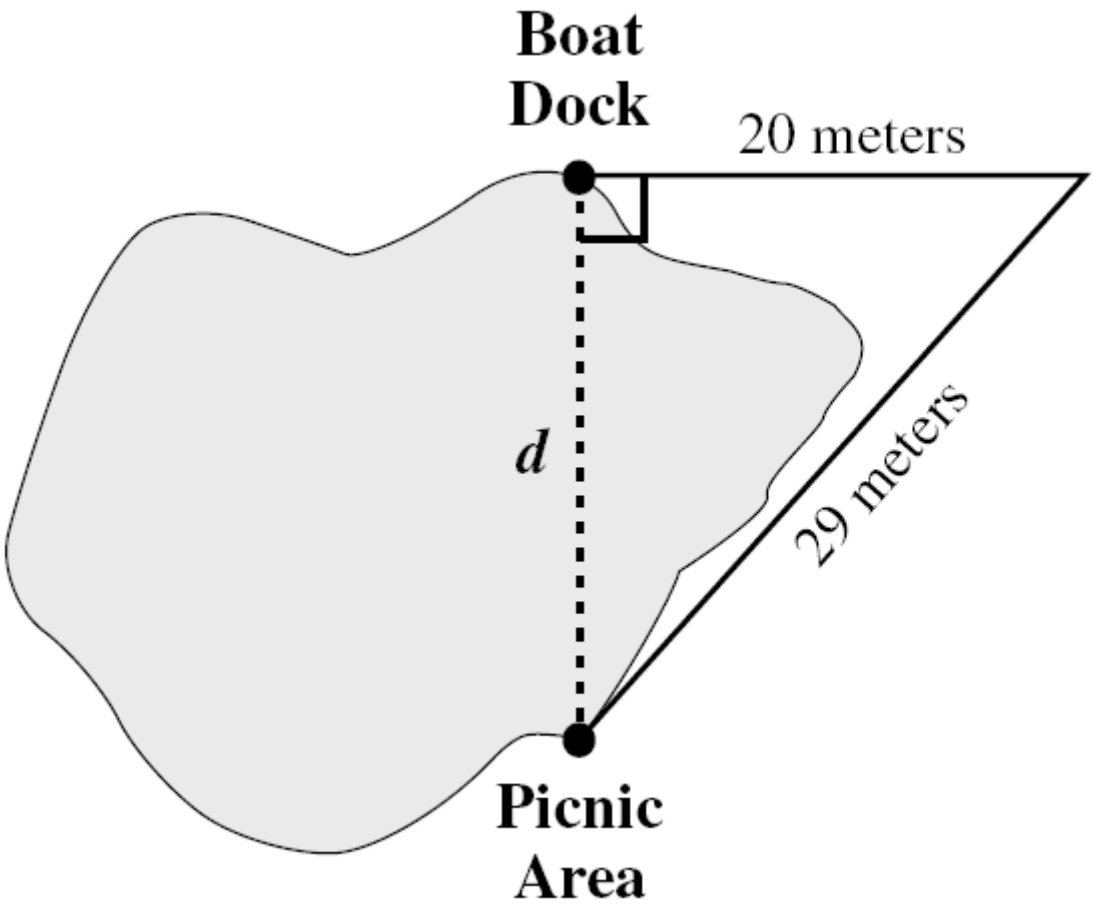
Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 50**
✗ B. 65
✗ C. 90
✗ D. 130

Hint 1:
The sum of the angles in red and **x** should be equal to 180.
Hint 2:
65 + 65 + x = 180
Hint 3:
The correct answer is 50. Please select 50

12.) "2005Nov_25_gr10_calc" (Problem ID: 13659) RADIO_BUTTON [MA - 2005 - NOV - 25]

No knowledge components have been assigned



Malik used the measurements shown in the diagram above to find the distance across a pond between a boat dock and a picnic area.

What is d, the distance between these two points?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 18 meters
✓ **B. 21 meters**
✗ C. 25 meters
✗ D. 49 meters

(Problem ID: 13660) RADIO_BUTTON [MA - 2005 - NOV - 25]

No knowledge components have been assigned

The triangle shown is a right triangle, we should know of a relationship between two legs and the hypotenuse. Which of the following represents this?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. $d + 29 = 20$
✗ B. $20^2 + 29^2 = d^2$
✗ C. $29^2 + d^2 = 20^2$
✓ **D. $20^2 + d^2 = 29^2$**

Hint 1:

$$a^2 + b^2 = c^2$$

This is the Pythagorean theorem. a and b are the legs and c is the hypotenuse. The value we are looking for, d, is one of the legs.
Hint 2:
We know one leg, we'll let this one be a, is 20, d is the variable used for the other leg, and the hypotenuse is 29. Substitute these values into the formula to get the answer.
Hint 3:
So we get $20^2 + d^2 = 29^2$. Select $20^2+d^2 = 29^2$

(Problem ID: 13661) RADIO_BUTTON [MA - 2005 - NOV - 25]

No knowledge components have been assigned

So now, let's solve for **d**. This will be the answer.

We have the formula $20^2 + d^2 = 29^2$

What is **d**?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 18 meters
✓ **B. 21 meters**
✗ C. 25 meters
✗ D. 49 meters

Hint 1:
Start with:
$20^2 + d^2 = 29^2$

Now simplify the exponents:
$400 + d^2 = 841$
Hint 2:
Now let's get d on one side by itself:
$d^2 = 841 - 400$

And simplify: $d^2 = 441$
Hint 3:

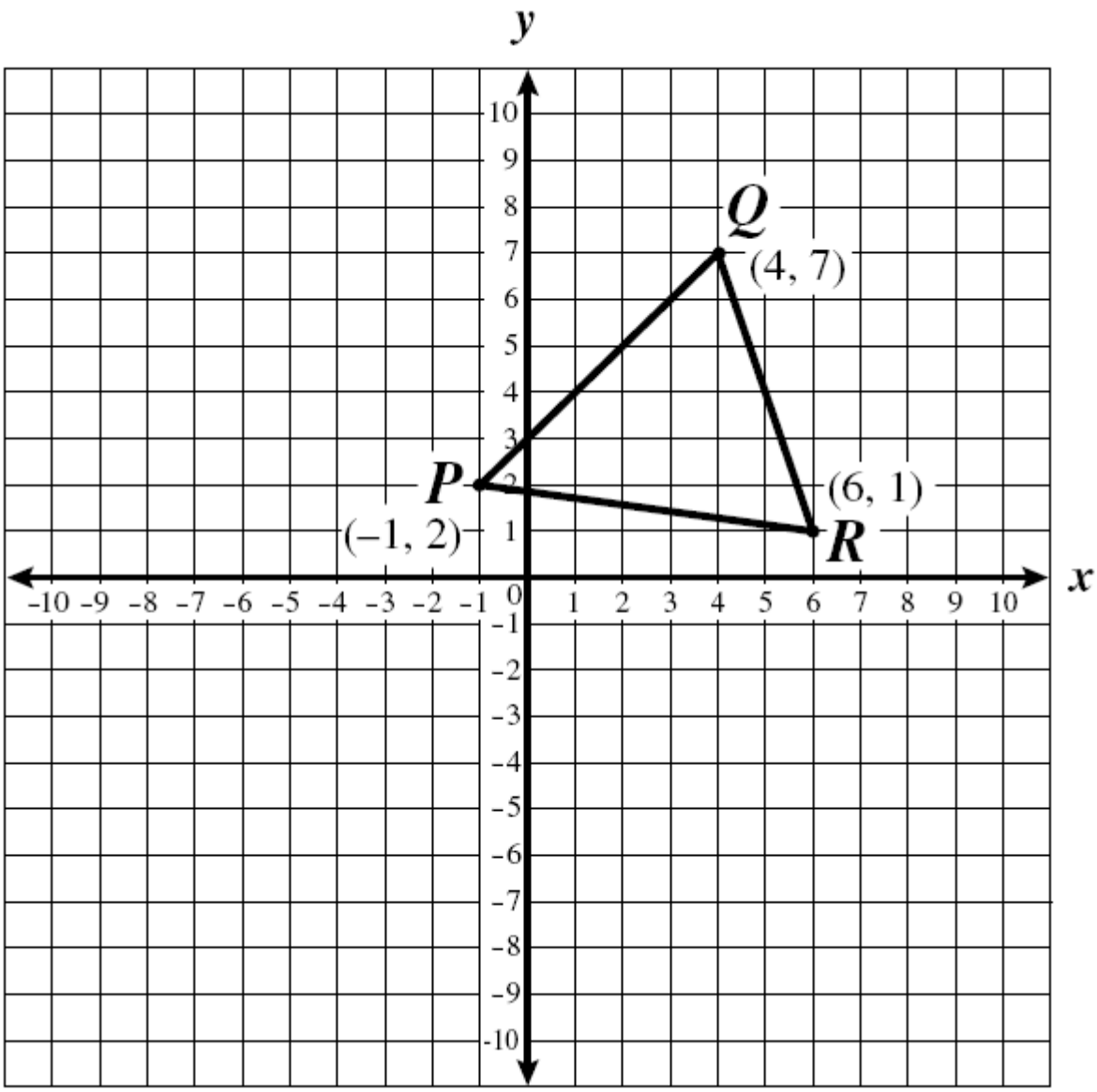
$$\sqrt{d^2} = \sqrt{441}$$

$$d = 21$$

Take the square root of both sides and you will have d as shown above.
Hint 4:
The correct answer is 21 meters. Please select 21 meters

13.) "2005Nov_18_gr10_nocalc" (Problem ID: 13676) RADIO_BUTTON [MA - 2005 - Spring - 18]

No knowledge components have been assigned



Sydney accurately sketched triangle P'Q'R', the reflection of triangle PQR across the x-axis. What are the coordinates of point Q' in triangle P'Q'R'?

Answers: (Interface Type: RADIO_BUTTON)

✗ D. (16, 49)
✗ A. (-4, -7)
✓ **B. (4, -7)**
✗ C. (-4, 7)

(Problem ID: 13677) RADIO_BUTTON [MA - 2005 - Spring - 18]

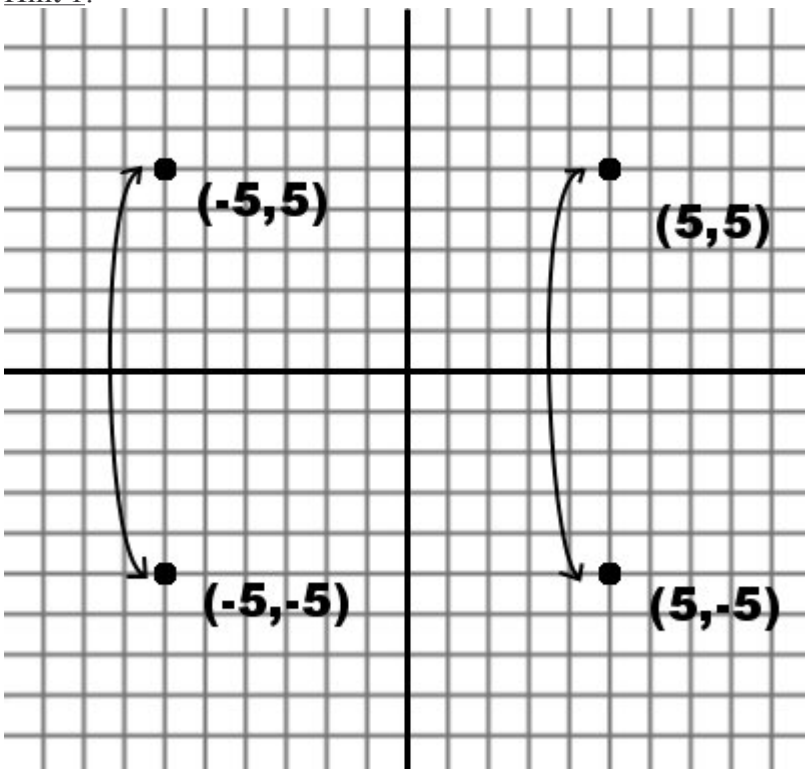
No knowledge components have been assigned

If a point is at (x,y), where will it be after a reflection across the x-axis?

Answers: (Interface Type: RADIO_BUTTON)

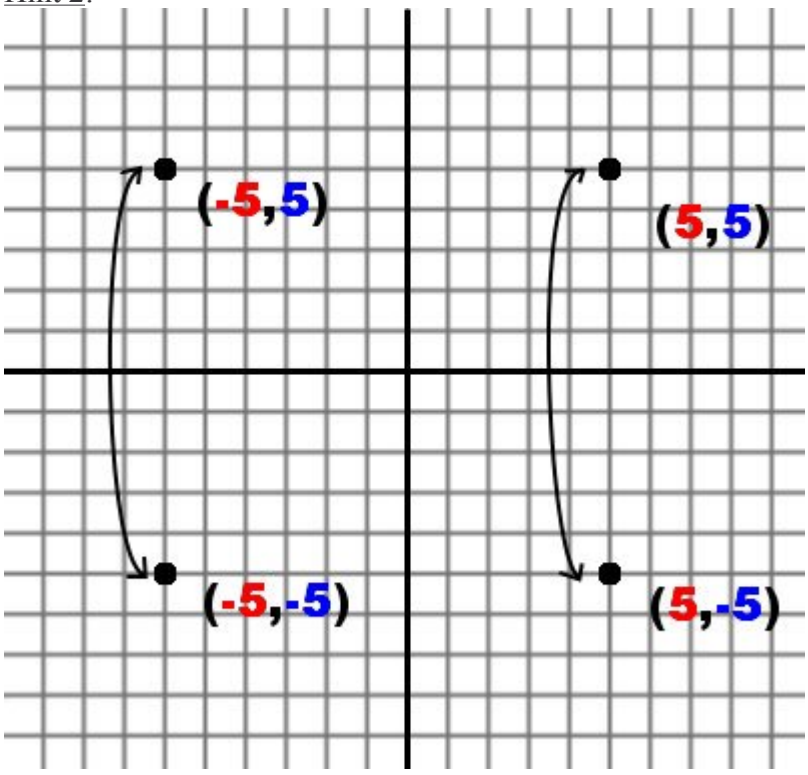
✗ A. (x+y, x-y)
✗ C. (-x, y)
✓ **D. (x, -y)**
✗ B. (-x, -y)

Hint 1:



Another way to think of a point reflected across the x-axis is to think of the x-axis as a mirror. On the opposing side of the x-axis is the mirror image of your point.

Hint 2:



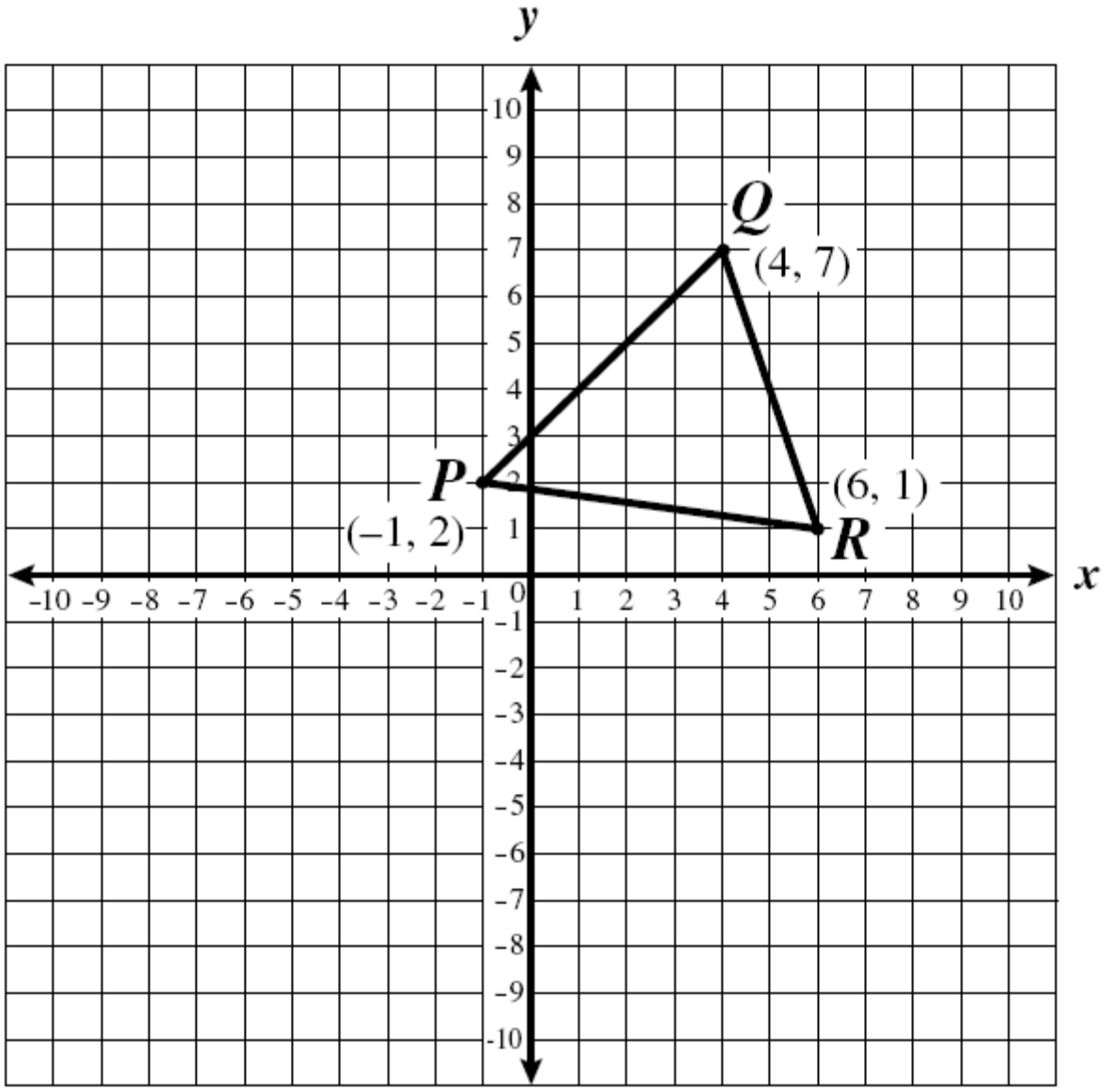
The x coordinate will stay the same (in red), but what happens to the y coordinate(in blue)?

Hint 3:

The correct answer is (x, -y). Please select (x, -y)

(Problem ID: 13678) RADIO_BUTTON [MA - 2005 - Spring - 18]

No knowledge components have been assigned



So if a point (x,y) is reflected across the x-axis is (x,-y), what is the coordinate of point Q' from the triangle P'Q'R', the reflection of triangle PQR across the x-axis?

Answers: (Interface Type: RADIO_BUTTON)

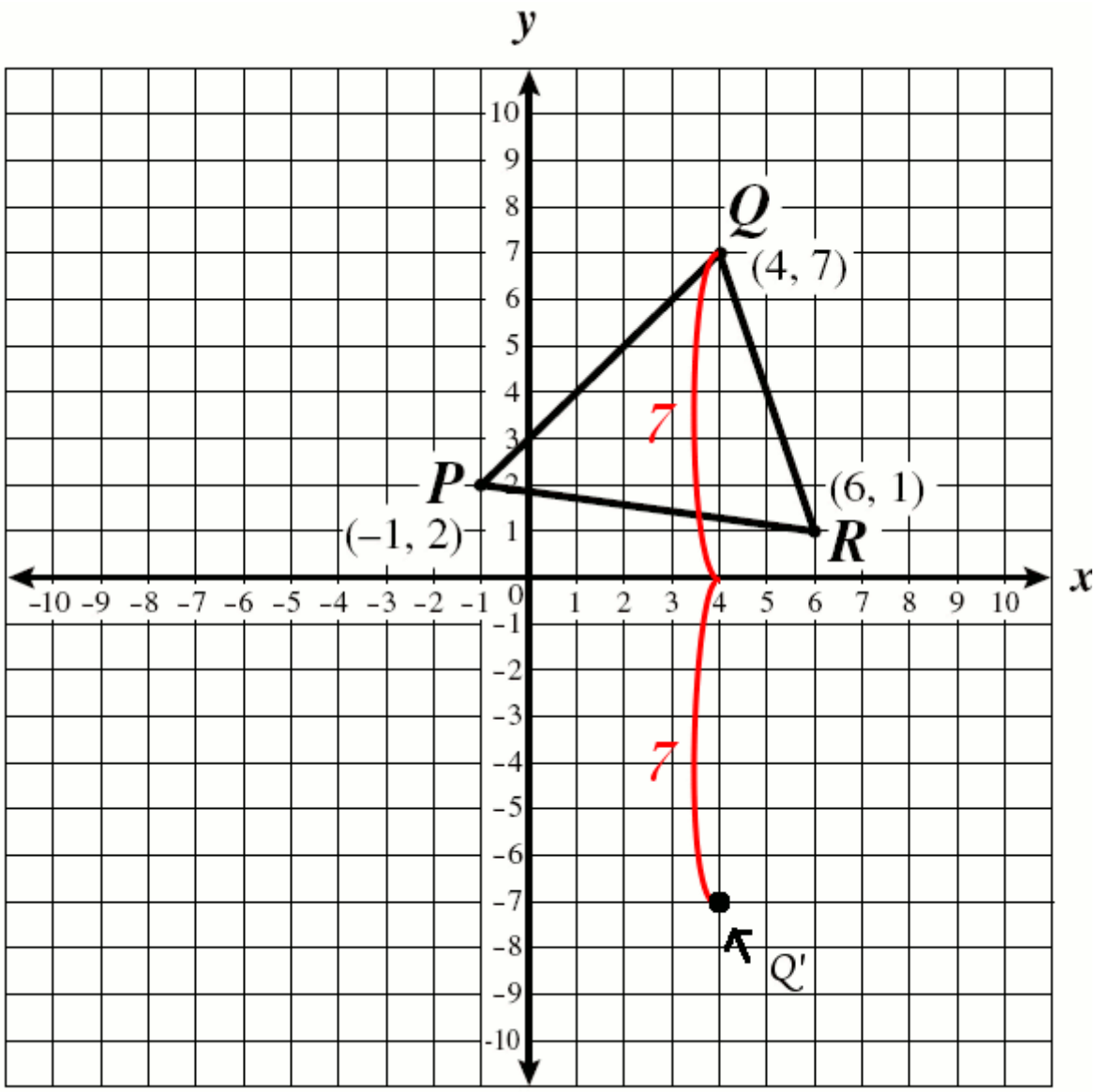
✗ A. (-4, -7)

✓ **B. (4, -7)**

✗ C. (-4, 7)

✗ D. (16, 49)

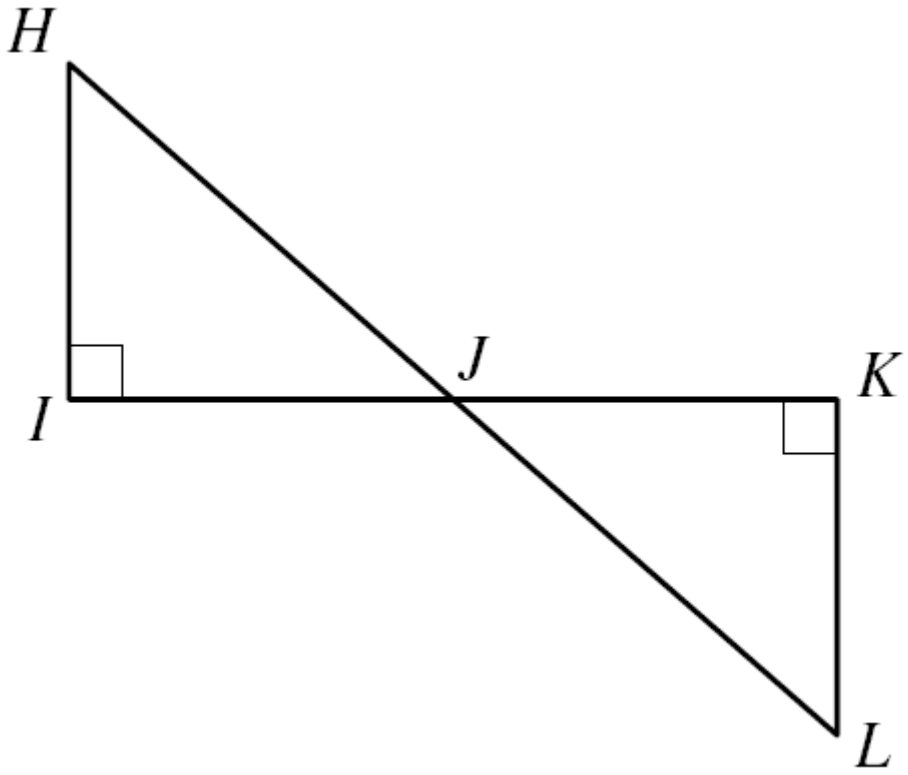
Hint 1:



Point Q is (4,7), apply the relationship we discovered earlier. What is point Q'?
Hint 2:
The sign of the y coordinate changes.
Hint 3:
The correct answer is (4, -7). Please select (4, -7)

14.) "2005Nov_05_gr10_nocalc" (Problem ID: 13685) RADIO_BUTTON [MA - 2005 - NOV - 5]

No knowledge components have been assigned



In the figure above, triangle HIJ is congruent to triangle LKJ. If the measure of angle L is 50 degrees, what is the measure of angle IJH?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 35
✓ **B. 40**
✗ C. 45
✗ D. 50

(Problem ID: 13686) RADIO_BUTTON [MA - 2005 - NOV - 5]

No knowledge components have been assigned

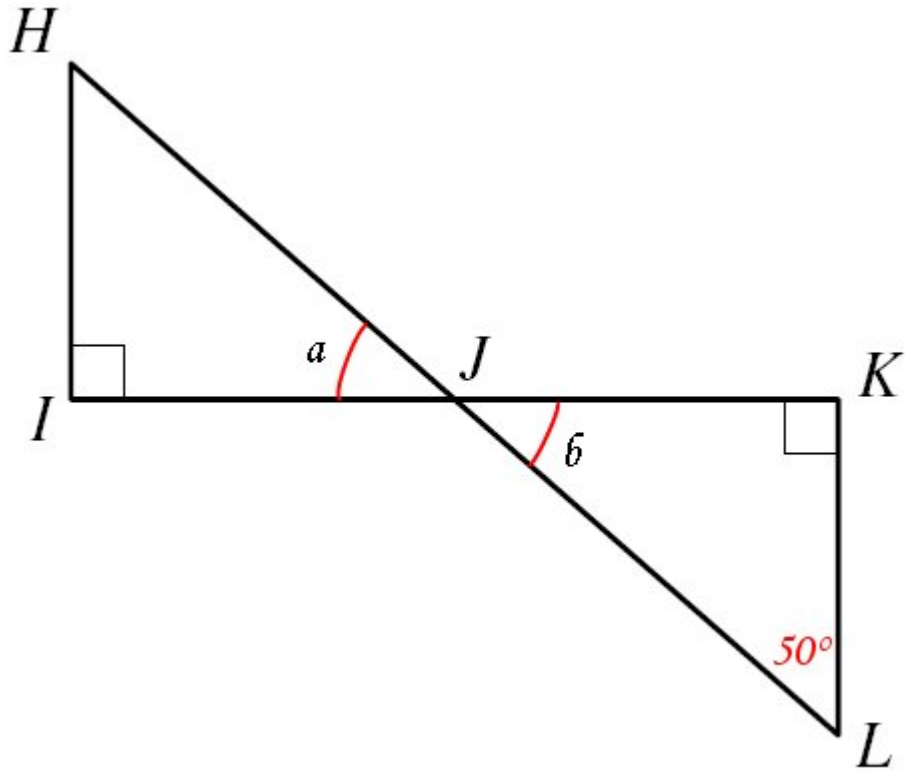
First, it always helps to draw a sketch. Draw the original picture and mark what you know from the problem and mark what you are looking for.

What is the best way to describe the way in which angles IJH (let's call it a) and KJL (let's call it b) relate?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. Vertical angles**
✗ B. Complementary
✗ C. Supplementary
✗ D. Horizontal angles
✗ E. Perpendicular

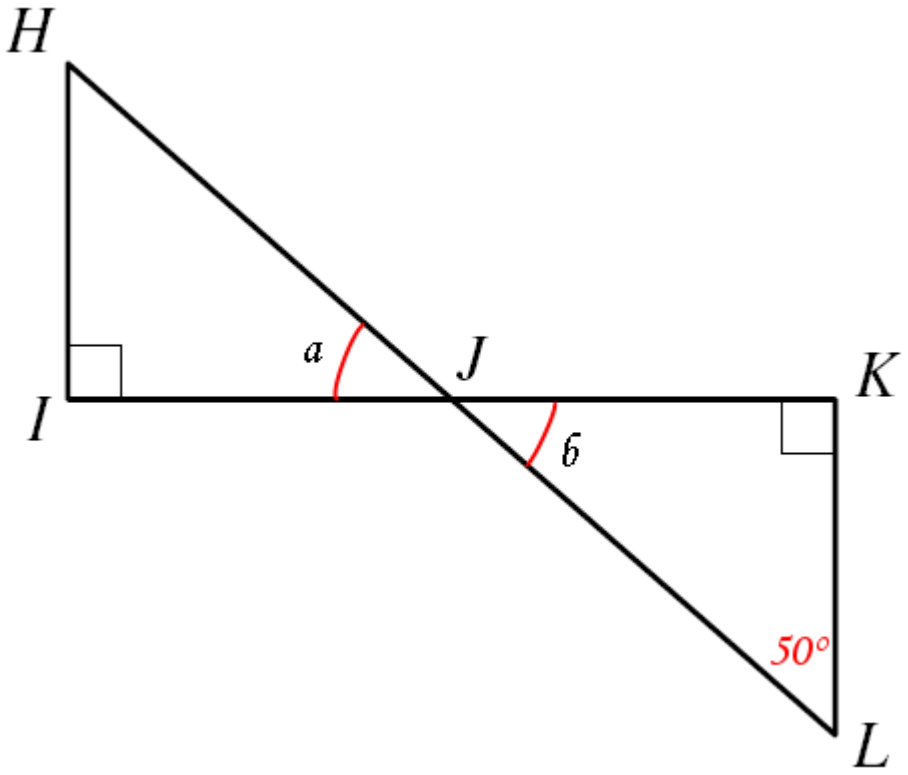
Hint 1:



These angles are equal, but what concept suggests this?
Hint 2:
If two angles are opposite each other where two lines intersect, they are called "vertical angles"
Hint 3:
The correct answer is Vertical angles. Please select Vertical angles.

(Problem ID: 13687) TEXT_FIELD [MA - 2005 - NOV - 5]

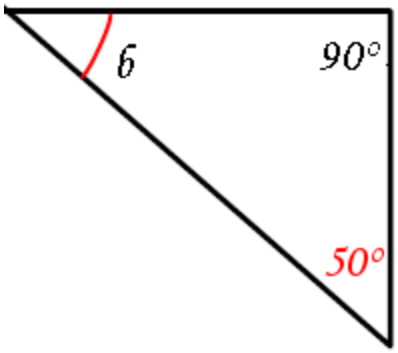
No knowledge components have been assigned



Now we know and b are vertical angles and since vertical angles are congruent, we can determine a if we know b.

How many degrees is the measure of angle b?
Answers: (Interface Type: TEXT_FIELD)
✓ **40**

Hint 1:

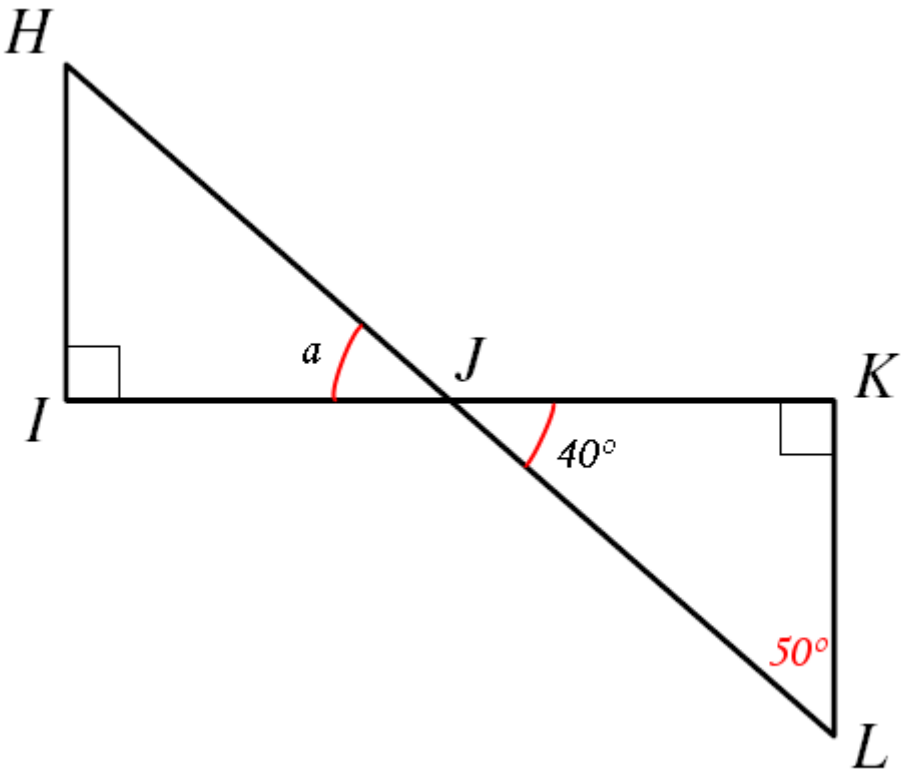


Angle b forms a triangle with angle K (a right angle) and angle L (which is 50 degrees)

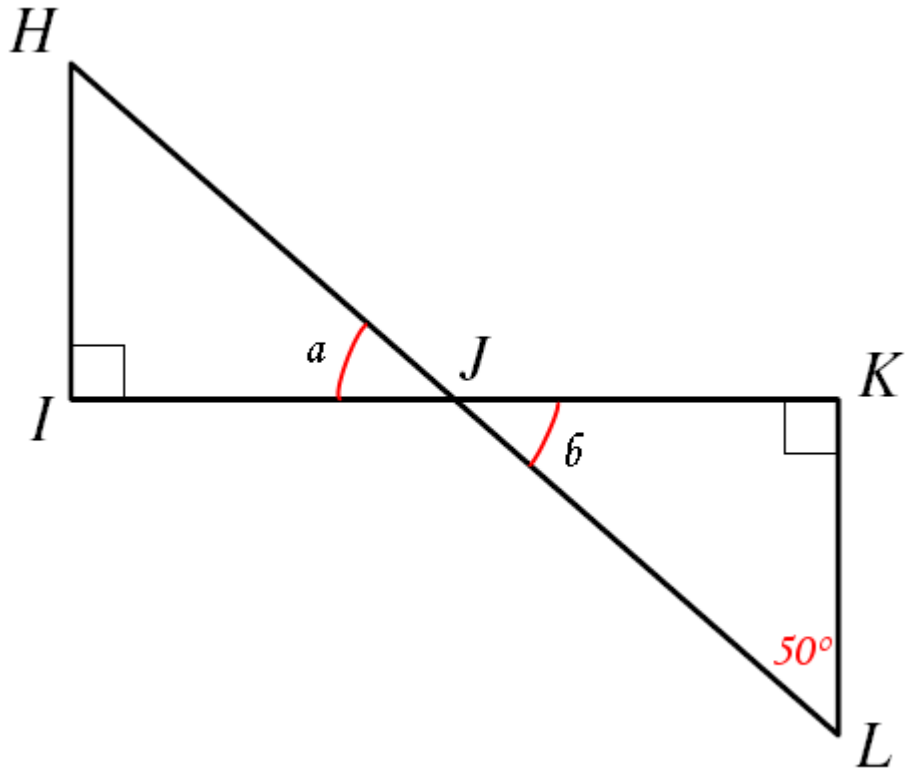
Use what you know about the angles of a triangle to find b. (see picture above)
Hint 2:
The sum of the interior angles of a triangle is 180.

Hint 3:
Solve 90 + 50 + b = 180 for **b**.
Hint 4:
b = 180 - 90 - 50 = 40. The answer is 40?. Please enter 40

(Problem ID: 13867) RADIO_BUTTON [MA - 2005 - NOV - 5]
No knowledge components have been assigned



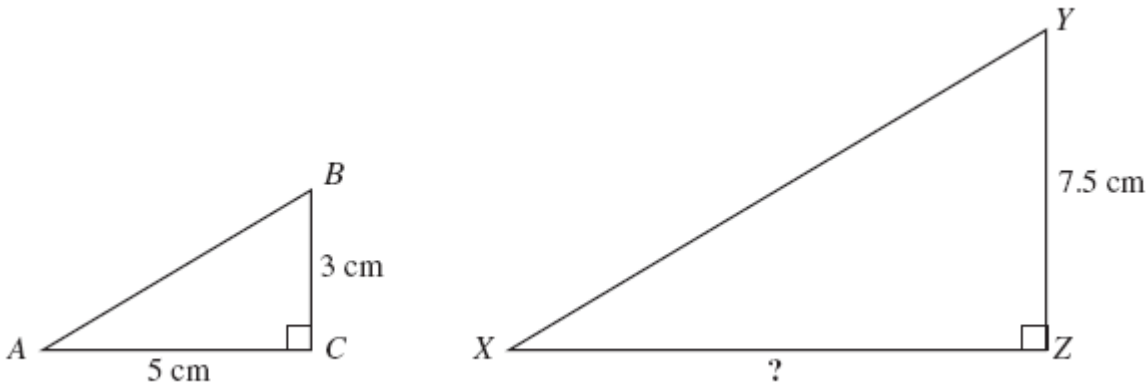
Let's go back to the original question now with all of this information in mind. What is the measure of angle IJH? (denoted as a in the sketch above)
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 35
✓ **B. 40**
✗ C. 45
✗ D. 50
Hint 1:



Remember that we found out a and b are vertical angles which means they are equal. We found the measure of angle b to be 40?
Hint 2:
The correct answer is 40?. Please enter 40

15.) "2004_25_gr10" (Problem ID: 12652) RADIO_BUTTON [MA - 2004 - Spring - 25]

No knowledge components have been assigned



In the picture shown above, triangle ABC is similar to XYZ.

What is the length of XZ?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 2.0 cm

✗ B. 4.5 cm
✓ **C. 12.5 cm**
✗ D 22.5 cm

(Problem ID: 12653) RADIO_BUTTON [MA - 2004 - Spring - 25]

No knowledge components have been assigned

Two triangles that are similar have equal corresponding angles and their corresponding sides are proportional. Which side of ABC corresponds to XZ?

Answers: (Interface Type: RADIO_BUTTON)

✗ XY
✗ AB
✓ **AC**
✗ BC

Hint 1:
Corresponding sides have the same position. Since XZ is the longest leg of the right triangle XYZ then its corresponding side is the longest leg of the triangle ABC.
Hint 2:
AC corresponds to XZ. Please select AC.

(Problem ID: 12654) RADIO_BUTTON [MA - 2004 - Spring - 25]

No knowledge components have been assigned

$A.\ \frac{7.5}{5} = \frac{XZ}{3}$ $C.\ \frac{7.5}{XZ} = \frac{5}{3}$

$B.\ \frac{7.5}{3} = \frac{XZ}{5}$ $D.\ \frac{7.5}{1} = \frac{XZ}{3}$

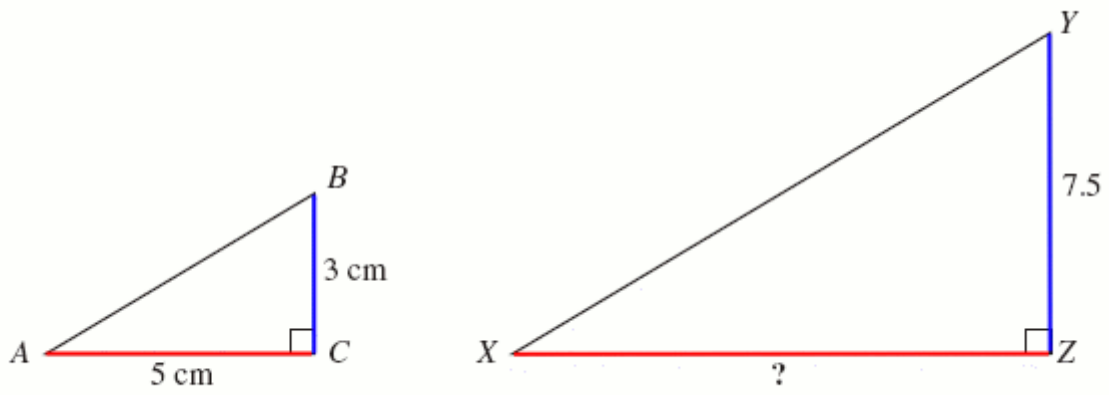
Now let us set up a ratio between corresponding sides for which we know the measurement of and XZ and AC.

Which of the above is accurate?

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✓ **B**
✗ C
✗ D

Hint 1:



To set up the proportion you need to put corresponding sides in the same place. Note the blue sides are corresponding and the red sides are corresponding.
Hint 2:

$$\text{Let's start with } \frac{\text{Large Blue}}{\text{Small Blue}} \text{ or}$$

$$\frac{7.5}{3} \text{(which is the equivalent ratio)}$$

false
Hint 3:
Now try to find the ratio for the red sides and set that ratio equal to the ratio for the blue sides that we just found.
Hint 4:

$$\frac{7.5}{3} = \frac{XZ}{5}$$

The correct answer is B. Please select B

(Problem ID: 12655) ALGEBRA_FIELD [MA - 2004 - Spring - 25]

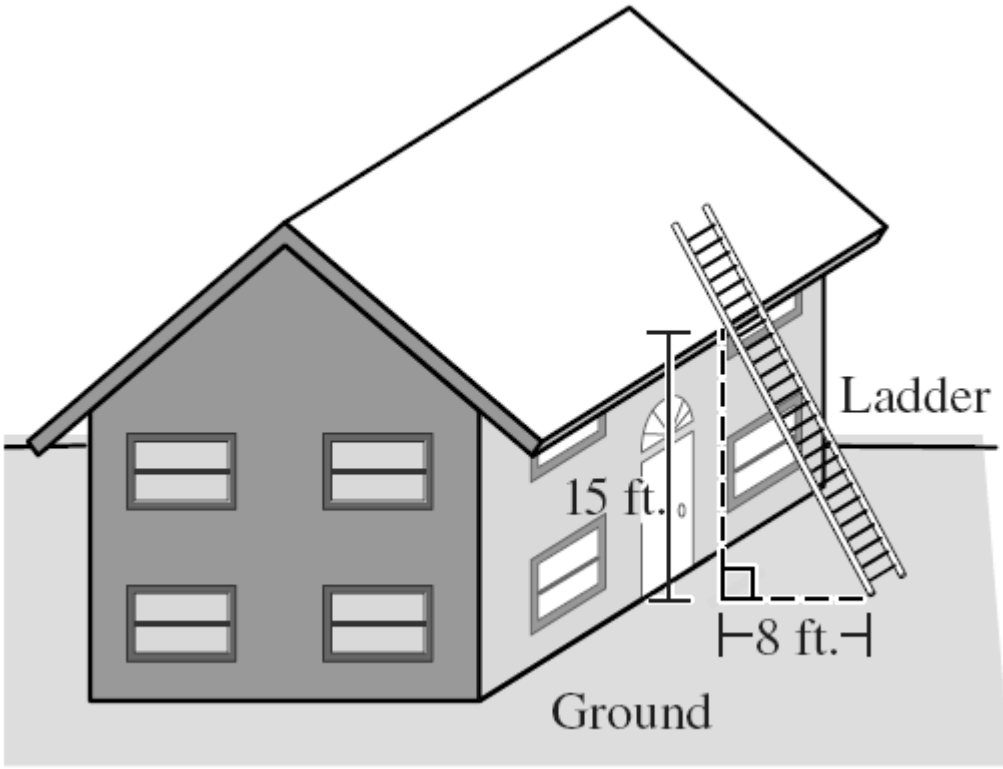
No knowledge components have been assigned
So, now using the ratio we just found. Let's solve for XZ. What is the answer?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **12.5**

Hint 1:
Multiply both sides of the ratio equation by 5 and then simplify.
Hint 2:
5(7.5)/3 = 12.5

The answer is 12.5

16.) "2004_33_gr10_calc" (Problem ID: 12656) RADIO_BUTTON [MA - 2004 - Spring - 33]

No knowledge components have been assigned



Using the measurements shown in the sketch, what is the length of the section of the ladder from the point where it rests on the ground to the point where it touches the house?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 4.8 ft
✗ B. 7 ft
✗ C. 17 ft
✓ **D. 23 ft**

(Problem ID: 12657) RADIO_BUTTON [MA - 2004 - Spring - 33]

No knowledge components have been assigned

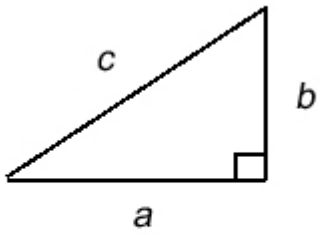
The ladder is the hypotenuse of a right triangle formed with the ground and the side of the house.

Which of the following formulas will help us find the length of the ladder? (x is the length of the ladder)

Answers: (Interface Type: RADIO_BUTTON)

✗ $8^2 + x^2 = 15^2$
✗ $8 + 15 = x$
✗ $8*15 = x$
✓ **$8^2 + 15^2 = x^2$**
✗ $15^2 + x^2 = 8^2$

Hint 1:



$a^2 + b^2 = c^2$

Use the Pythagorean Theorem to setup an equation to solve for the distance of the hypotenuse. Refer to your reference sheet to find the Pythagorean Theorem or look at the image above.
Hint 2:
Substituting in the measurements gives us. $\mathbf{8^2 + 15^2 = x^2}$

Please select this equation from the answer choices.

(Problem ID: 12658) RADIO_BUTTON [MA - 2004 - Spring - 33]

No knowledge components have been assigned

Using the equation we found above, find x, the length of the ladder.

Answers: (Interface Type: RADIO_BUTTON)

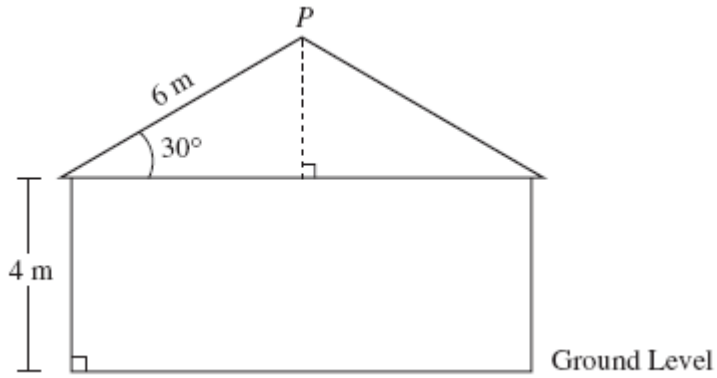
✗ A. 4.8 ft
✗ B. 7 ft
✗ C. 17 ft
✓ **D. 23 ft**

Hint 1:
$8^2 + 15^2 = x^2$

Before you solve for x, you should simplify.
Hint 2:
Evaluate the exponents first.
Hint 3:
Now you have $64 + 225 = x^2$
This is also $289 = x^2$
Hint 4:
Take the square root of both sides.
Hint 5:
The square root of 289 is 23. The answer is 23 ft.

17.) "2005_29_gr10_calc" (Problem ID: 13139) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

No knowledge components have been assigned



The diagram above show the side view of a house. The base of its roof is 4 meters above ground level.

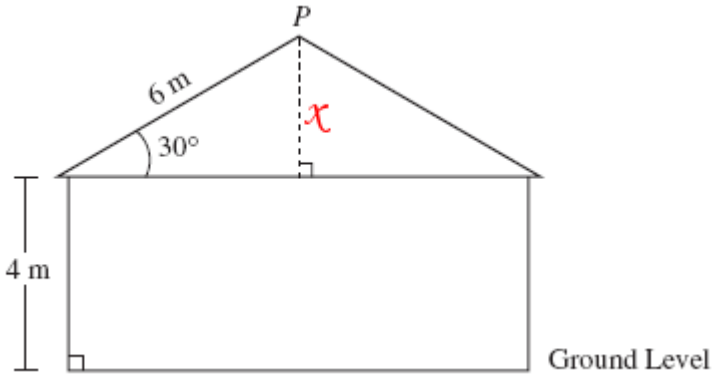
Point P is the highest point on the roof. Based on the diagram, what is the distance from P to the ground level?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ 7

(Problem ID: 13140) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

No knowledge components have been assigned



Find **x**

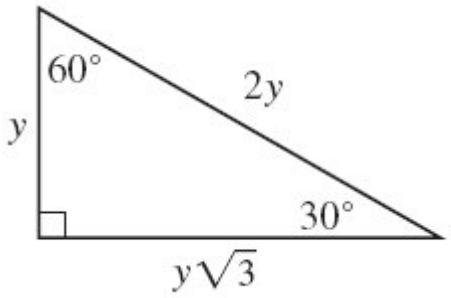
Once x is found, it can be added to the rest of the height of the house, which we already know.

What is x?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **3**

Hint 1:



x is one leg of a 30,60,90 triangle. We know the value of the hypotenuse and the side of our triangle. Refer to your reference sheet for a relationship.
Hint 2:
We should be able to see from the 30,60,90 triangle on the reference sheet that our hypotenuse must be 2 times as long as x.
Hint 3:
Since 2?3 = 6. The answer is 3.

(Problem ID: 13142) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

No knowledge components have been assigned

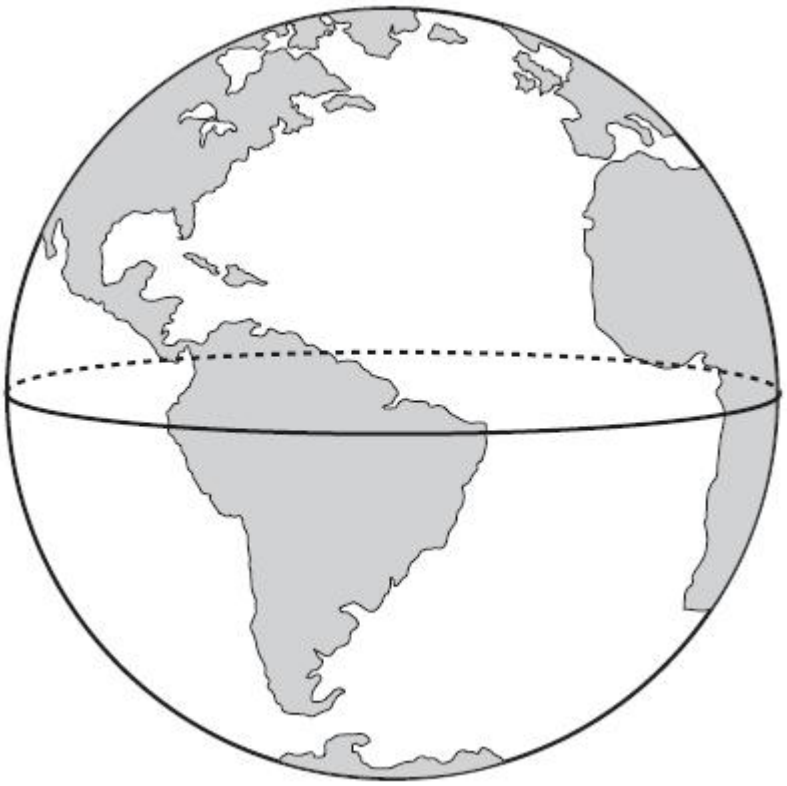
x is now known and is the height from the base of the roof to the top of the house. We also know the height from the ground level to the base of the roof.

What is the height of the house?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **7**

Hint 1:
Add the heights together. 4 is the value of the height from the ground to the base of the roof. 3 is value from the base of the roof to the top.
Hint 2:
4 + 3 = 7. The answer is 7.

18.) "2005_27_gr10_calc" (Problem ID: 13868) RADIO_BUTTON [MA - 2005 - Spring - 27]

No knowledge components have been assigned



Tiffany wants to calculate the volume of her globe. The globe is in the shape of a sphere, as represented by the picture below. She measures the circumference of the globe along the equator to be 24 inches.

Which of the following measures is closest to the volume of Tiffany's globe?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 46 cubic inches**
✗ **B. 61 cubic inches**
✗ **C. 183 cubic inches**
✓ **D. 234 cubic inches**

(Problem ID: 13869) RADIO_BUTTON [MA - 2005 - Spring - 27]

No knowledge components have been assigned

$$V = \frac{4}{3}\pi * r^3$$

Refer to your reference sheet for the volume of a sphere. The formula is shown above. In order to calculate the volume of the sphere, we will need to find the radius.

Find r.
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 4**
✗ **B. $12^2/\pi$**
✗ **C. $144\pi^2$**

✓ **D. 12/π**

Hint 1:
Remember that we know the circumference is 24 inches.
Hint 2:
Refer to your reference sheet for the formula for the circumference of a sphere (which is the same as the circumference of a circle)

The formula is:
C = 2πr
Hint 3:
The circumference is 24. Substitute it into the formula for the cimcumference:
24 = 2πr

And now simplify:
24/(2π) = r
12/π = r
Hint 4:
The radius of the circle is 12/π Please select D.

(Problem ID: 13870) RADIO_BUTTON [MA - 2005 - Spring - 27]

No knowledge components have been assigned

$$V = \frac{4}{3}\pi * r^3$$

Now that we know the radius of the sphere is 12/π, let's substitute that into the formula for the volume of a sphere which is stated again above. Solve for the volume.
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 46 cubic inches**
✗ **B. 61 cubic inches**
✗ **C. 183 cubic inches**
✓ **D. 234 cubic inches**

Hint 1:

$$V = \frac{4}{3}\pi * r^3$$

$$V = \frac{4}{3}\pi * \left(\frac{12}{\pi}\right)^3$$

As shown above, substitute in our known value of the radius for r.
Hint 2:

$$V = \frac{4}{3}\pi * r^3$$

$$V = \frac{4}{3}\pi * \left(\frac{12}{\pi}\right)^3$$

$$V = \frac{4 * \pi * 12 * 12 * 12}{3 * \pi * \pi * \pi}$$

$$V \approx 233.444$$

Next, simplify the expression so that you can easily use your calculator to compute the answer (as shown above)
Hint 3:
The answers we can choose from are not exact, so we must pick the one that is closest to our computed value.
Hint 4:
The volume of the sphere with circumference 24 is about 234. Select D.

19.) "2006_18_gr10_nocalc" (Problem ID: 13904) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

The volume of Anand's cube is 8 cubic centimeters. What is the total surface area, in square centimeters, of his cube?

Answers: (Interface Type: TEXT_FIELD)

✓ **24**

(Problem ID: 13905) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

In order to find the surface area, we must first find the lengths of the edges. Therefore, we must use the volume of the cube to determine the length of the edge.

Refer to your reference sheet for the formula for the volume of a cube, which we know, in terms of the length of the edges.

What is the length of one edge of this cube?

Answers: (Interface Type: TEXT_FIELD)

✓ **2**

Hint 1:
The volume of a cube is:
$V = s^3$
Hint 2:
Substitute in the value of the volume:
$8 = s^3$
Hint 3:

Take the cube root of both sides:
2 = s
Hint 4:
The length of an edge of the cube is 2. Please enter 2.

(Problem ID: 13906) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned
Now that we know the length of an edge, 2, use the formula for the total surface area of the cube. Compute the total surface area.
Answers: (Interface Type: TEXT_FIELD)
✔ **24**

Hint 1:
The formula for the total surface area of a cube is:
$SA = 6s^2$

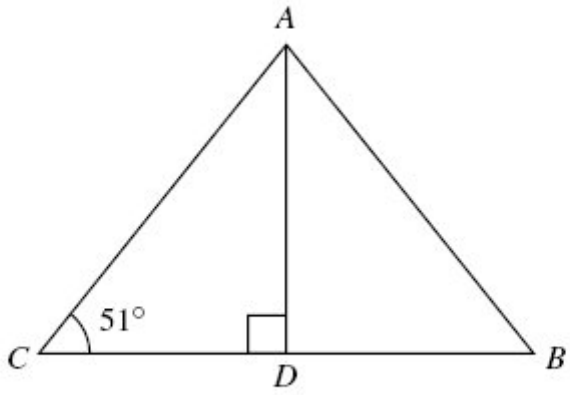
Substitute in the value, 2, for the length of an edge:
$SA = 6*2^2$

Hint 2:
Simplify:
SA = 24
Hint 3:
The surface area of the cube is 24. Please enter 24.

20.) "2005m_16_gr10_nocalc" (Problem ID: 14084) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned

In $\triangle ABC$ shown below, $\overline{AD}$ is the perpendicular bisector of $\overline{CB}$.



What is the measure, in degrees, of $\angle CAB$?

Answers: (Interface Type: TEXT_FIELD)
✔ **78**

(Problem ID: 14085) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned

To find CAB, we need to find CAD and DAB. How many degrees is the measure of angle CAD?

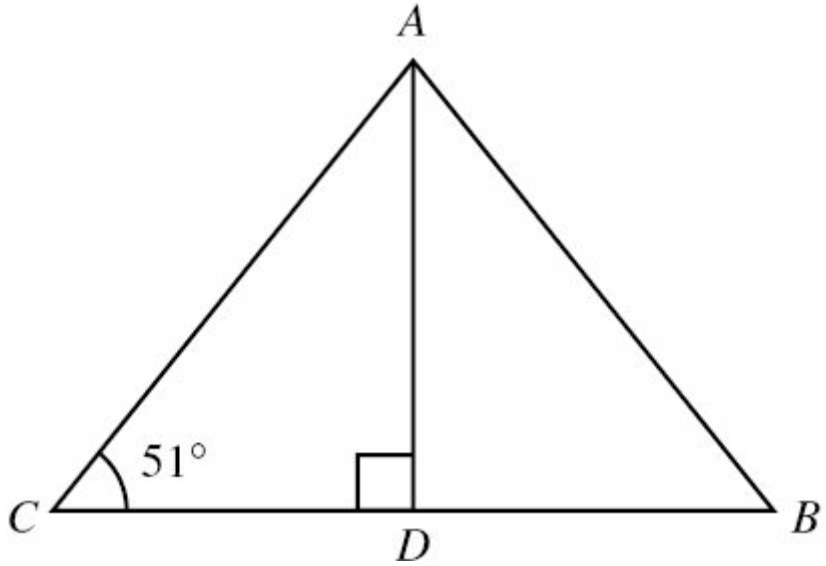
Answers: (Interface Type: TEXT_FIELD)

✓ **39**

Hint 1:
Angle CAD is part of a triangle for which we know the other two angles to be 51? and 90?.
Hint 2:
The sum of the interior angles of a triangle is 180?.
Hint 3:
Solve 51 + 90 + CAD = 180
Hint 4:
141 + CAD = 180
141 - 141 + CAD = 180 - 141
CAD = 39
Hint 5:
The measure of CAD is 39?. Please enter 39

(Problem ID: 14086) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned



Now that we have found angle CAD, find the measure of angle DAB.

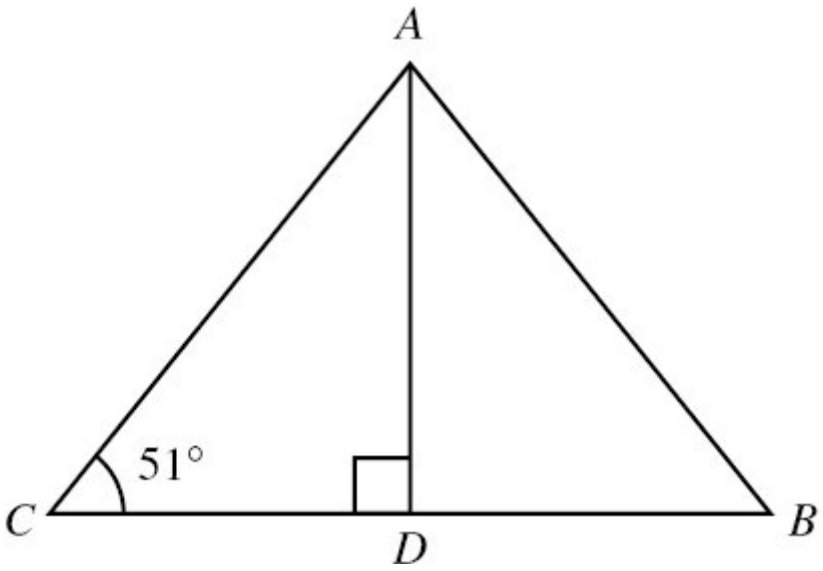
Answers: (Interface Type: TEXT_FIELD)

✓ **39**

Hint 1:
Remember that AD perpendicularly bisects CB.
Hint 2:
Since AD bisects CB you know that AD splits angle CAB in half. Therefore, CAD and DAB will be equal.
Hint 3:
The measure of angle DAB is 39, just like CAB. Please enter 39.

(Problem ID: 14087) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned



Returning to the initial question, angles CAD and BAD both measure 39?. What is the measure of angle CAB?

Answers: (Interface Type: TEXT_FIELD)

✓ **78**

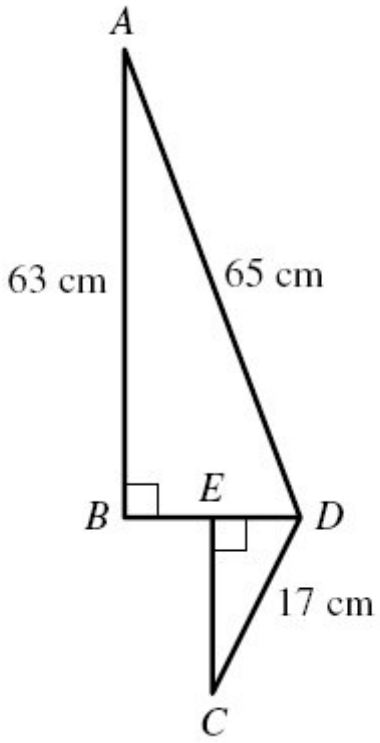
Hint 1:
The measure of angle CAB is equal to the measure of both of its parts. So add up the measures of angles CAD and BAD.

Hint 2:
So, 39 + 39 = ?

Hint 3:
The measure of CAB is 78. Please enter 78.

21.) "2005m_33_gr10_calc" (Problem ID: 14088) RADIO_BUTTON [MA - 2005 - MAR - 33]

No knowledge components have been assigned



In the figure above, E is the midpoint of BD.

What is the length of CE?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 5.7 cm**
✗ **B. 8 cm**
✓ **C. 15 cm**
✗ **D. 18.8 cm**

(Problem ID: 14089) TEXT_FIELD [MA - 2005 - MAR - 33]

No knowledge components have been assigned
To find the measure of CE, we will need to find the measure of ED. To do that, we first need to find the measure of BD. Find BD.
Answers: (Interface Type: TEXT_FIELD)
✓ **16**

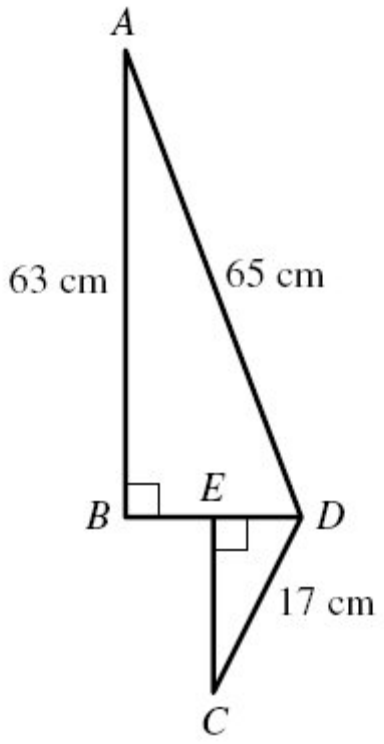
Hint 1:
Since triangle ABD is a right triangle, you can use the Pythagorean theorem. That is, $a^2 + b^2 = c^2$ (a and b are the legs and c is the hypotenuse)
Hint 2:
Substitute in your known values: $63^2 + b^2 = 65^2$

Simplify the exponents:
$3969 + b^2 = 4225$
Hint 3:
Put b^2 by itself:
$b^2 = 4225 - 3969$

Simplify:
$b^2 = 256$
Hint 4:
Take the square root of both sides:
b = 16
Hint 5:
The length of BE is 16. Please enter 16.

(Problem ID: 14090) TEXT_FIELD [MA - 2005 - MAR - 33]

No knowledge components have been assigned

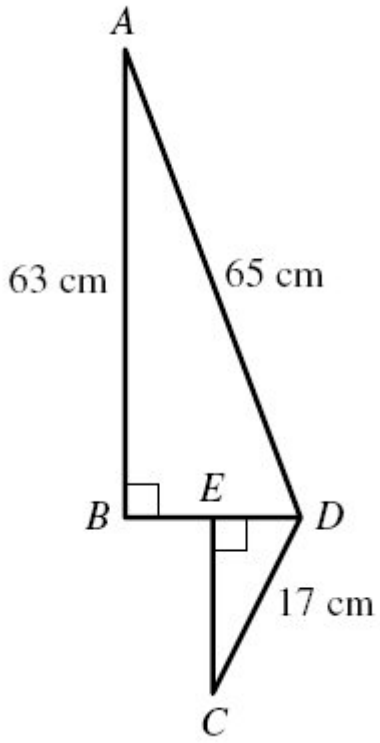


E is a midpoint of BD. We found that BD was 16. What is the measure of ED?
Answers: (Interface Type: TEXT_FIELD)
✔ **8**

Hint 1:
ED is half of BD.
Hint 2:
The length of ED is 8. Please enter 8.

(Problem ID: 14091) RADIO_BUTTON [MA - 2005 - MAR - 33]

No knowledge components have been assigned



And now we can return to the original problem. Find the measure of CE.

Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 5.7 cm**

✗ **B. 8 cm**

✓ **C. 15 cm**

✗ **D. 18.8 cm**

Hint 1:

You know two sides of a right triangle and you want to know the third side. Use the Pythagorean theorem.

Hint 2:

Substitute in your known values: $8^2 + b^2 = 17^2$

Simplify the exponents:

$64 + b^2 = 289$

Hint 3:

Put b^2 by itself:

$b^2 = 289 - 64$

Simplify:

$b^2 = 225$

Hint 4:

Take the square root of both sides:

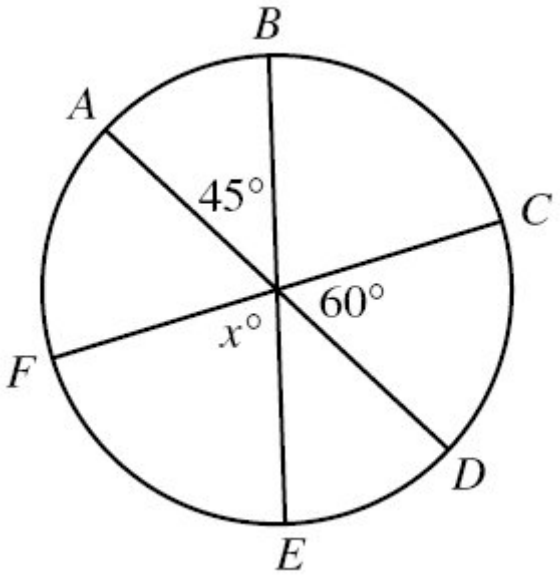
$b = 15$

Hint 5:

The length of EC is 15 cm. Please select C.

22.) "2006Nov_16_gr10" (Problem ID: 22700) TEXT_FIELD

No knowledge components have been assigned



In the circle shown above, AD, BE, and CF are diameters.

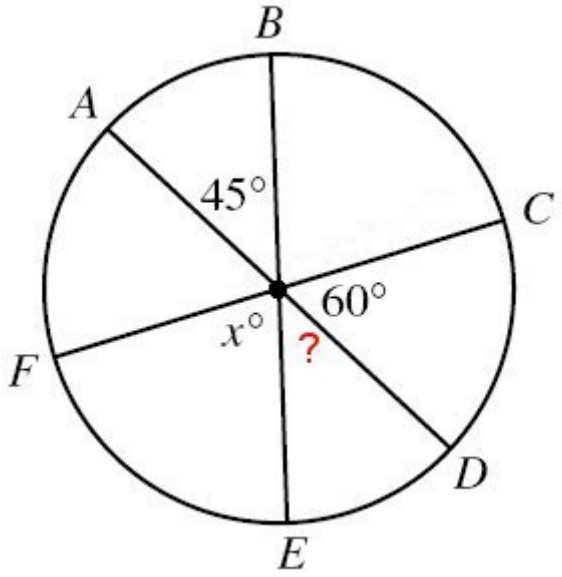
What is the value, in degrees, of x?

Answers: (Interface Type: TEXT_FIELD)

✔ **75**

(Problem ID: 22701) TEXT_FIELD

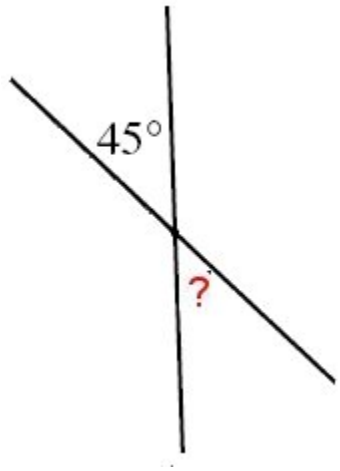
No knowledge components have been assigned



Because AD, BE, and CF are diameters for the circle the point that they intersect is the center of the circle.

Let's start by finding some of the other angles in the circle. What is the measure of the angle marked by the "?" in the picture?
Answers: (Interface Type: TEXT_FIELD)
✓ **45**

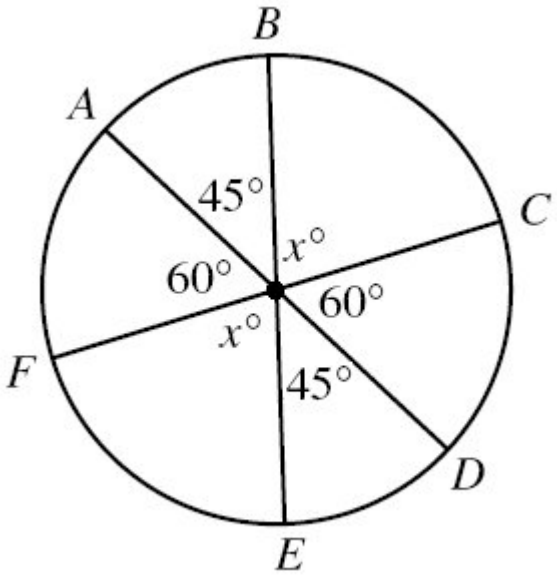
Hint 1:



Look at just the angle 45° and "?".
Hint 2:
When two lines intersect, opposing angles are called vertical angles. Vertical angles are congruent.
Hint 3:
Therefore, "?" is equal to 45°. Enter 45.

(Problem ID: 22702) TEXT_FIELD

No knowledge components have been assigned



There are other vertical angles in this circle too. They are filled in for the picture above.

Use the new information about the angles to solve for x. What is x?
Answers: (Interface Type: TEXT_FIELD)
✓ **75**

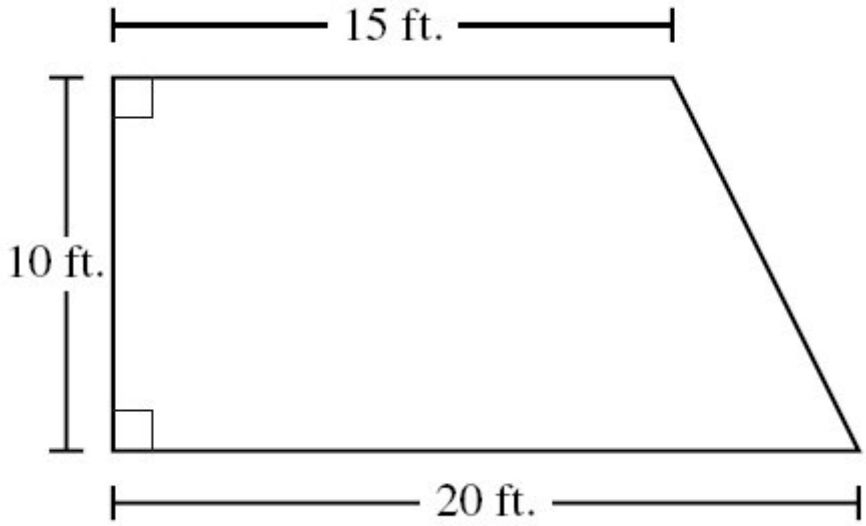
Hint 1:
The sum of all of the angles from the center of the circle should be 360º

Sum all of the angles together.
Hint 2:
x + x + 45 + 45 + 60 + 60 = 360
Or,
2x + 2(45) + 2(60) = 360
Now solve for x
Hint 3:
Carry out multiplication first.
2x + 90 + 120 = 360
Subtract 90 and 120 from both sides
Hint 4:
2x + 90 + 120 - 90 - 120 = 360 - 90 - 120

2x = 150
Now divide both sides by 2.
Hint 5:
x = 75. Enter 75

23.) "2006Nov_30_gr10_calc" (Problem ID: 22666) RADIO_BUTTON

No knowledge components have been assigned



The figure above shows the dimensions of the floor of a room that Enrico wants to carpet in his basement.

What is the area of the floor?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 150 sq. ft.**
✓ **B. 175 sq. ft.**
✗ **C. 200 sq. ft.**
✗ **D. 225 sq. ft.**

(Problem ID: 22667) RADIO_BUTTON

No knowledge components have been assigned

$A.\ \mathrm{A} = 10^2 + 15^2 + 20^2$

$B.\ \mathrm{A} = 20(15) - 10$

$C.\ \mathrm{A} = \frac{1}{2}10(20 + 15)$

$D.\ \mathrm{A} = \frac{1}{2}20(10)$

One way to approach a problem like this is to break it up into more simple shapes. At first glance, the figure can be seen as a rectangle and a triangle stuck together.

However, there is a more direct way to get the area. The figure shown is also a trapezoid. A trapezoid is a quadrilateral with two parallel sides. In this case, the side of length 15 ft. and the side of length 20 ft. are the parallel sides.

Which of the following sets up an equation to solve for the area of the figure using the formula for the area of a trapezoid? Look at your reference sheet.

Answers: (Interface Type: RADIO_BUTTON)

✗ **A**
✗ **B**
✓ **C**
✗ **D**

Hint 1:

$$A = \frac{1}{2}h(b_1 + b_2)$$

The formula for the area of a trapezoid is shown above. It can be found on your reference sheet.

b_1 and b_2 refer to the lengths of the bases of the trapezoid. h is the height.

Hint 2:

The bases of a trapezoid are also the two parallel sides. It doesn't matter which one we call b_1 orb_2 so we'll pick b_1 to be the side of length 20 ft.

b_1 = 20 ft. b_2 = 15 ft.

Hint 3:

The height is also given. It is 10 ft.

Substitute the values into the formula.

Hint 4:

$$A = \frac{1}{2}10(20+15)$$

The equation to solve is shown above. Select answer C.

(Problem ID: 22668) RADIO_BUTTON

No knowledge components have been assigned

Simplify the equation you just found to solve for the area of the trapezoid.

Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 150 sq. ft.**
✓ **B. 175 sq. ft.**
✗ **C. 200 sq. ft.**
✗ **D. 225 sq. ft.**

Hint 1:

$$A = \frac{1}{2}10(20+15)$$

Start by doing the work in the parentheses first.

(20 + 15) = ?
Hint 2:
(20 + 15) = 35

Substitute 35 in for (20+15)
Hint 3:

$$A = \frac{1}{2}10(20+15)$$

$$A = \frac{1}{2}10(35)$$

Now, multiply all of the remaining numbers together.
Hint 4:

$$A = \frac{1}{2}10(20+15)$$

$$A = \frac{1}{2}10(35)$$

$$A = 175 \text{ sq. ft.}$$

The area of the carpet is 175 sq. ft.
Choose B.

24.) "2006Nov_36_gr10_calc" (Problem ID: 22662) RADIO_BUTTON

No knowledge components have been assigned

Jessie has an aquarium that is shaped like a right rectangular prism with the following dimensions:

- **height: 15 inches**
- **width: 20 inches**
- **length: 30 inches**

What is the lateral surface area of a right rectangular prism with the dimensions of Jessie's aquarium?

Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 260 sq. in.**
✗ **B. 750 sq. in.**
✓ **C. 1500 sq. in.**
✗ **D. 9000 sq. in.**

(Problem ID: 22663) RADIO_BUTTON

No knowledge components have been assigned

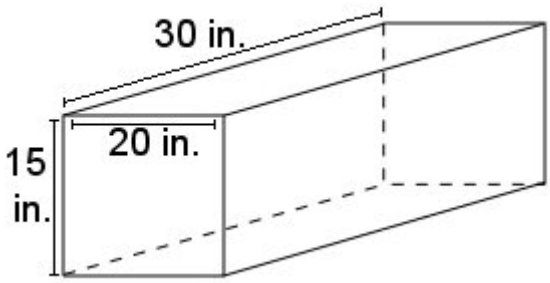
Let's start by setting up an equation for the lateral surface area. Remember, the lateral surface area is the areas of all of the sides (or faces) of the prism, but not the bases (the top and bottom areas)

Which of the following equations solves for the lateral surface area?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. LA = 2(15·20) + 2(30·15)**
✗ **B. LA = 4(30·15) + 2(30·20)**
✗ **C. LA = 2(30·20) + 2(15·20) + 2(30·15)**
✗ **D. LA = $30^2 + 15^2 + 20^2$**

Hint 1:



It always helps to draw a sketch. Your reference sheet has the formula for the lateral surface area of a right rectangular prism. It is:

LA = 2(h·w) + 2(l·h)
LA = front and back rectangles + left and right side rectangles
Remember the lateral surface area does not include the top and bottom
Hint 2:
Substitute in the appropriate values for height, width, and length. They are given in

the original problem and shown in the sketch above.
Hint 3:
h = 15
w = 20
l = 30

So,
LA = 2(15·20) + 2(30·15)
Select A.

(Problem ID: 22664) RADIO_BUTTON

No knowledge components have been assigned

Use the equation we just found to solve for the lateral surface area. What is the lateral surface area?

Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 260 sq. in.**
✗ **B. 750 sq. in.**
✓ **C. 1500 sq. in.**
✗ **D. 9000 sq. in.**

Hint 1:
The equation we found was:
LA = 2(15·20) + 2(30·15)
Start to simplify it by carrying through with the multiplications. Do the work in the paratheses first.
Hint 2:
15·20 = 300
Substitute 300 in for 15·20
LA = 2(300) + 2(30·15)

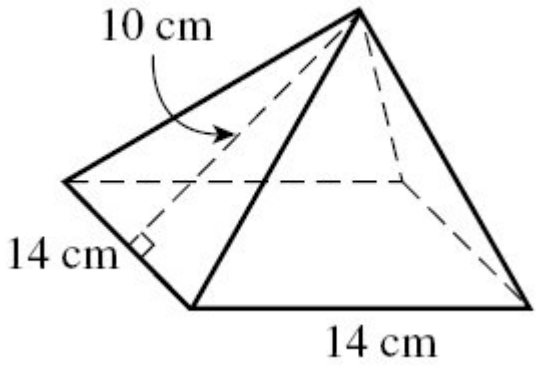
30·15 = 450
Substitute 450 in for 30·15
LA = 2(300) + 2(450)

Now multiply both 300 and 450 by 2.
Hint 3:
LA = 600 + 900

To finish, add 600 and 900 together.
Hint 4:
600 + 900 = 1500
Select C.

25.) "2005m_34_gr10_nocalc" (Problem ID: 22521) RADIO_BUTTON

No knowledge components have been assigned



The right pyramid pictured above has a square base measuring 14 centimeters on each side, and a slant height of 10 centimeters.

What is the difference between the total surface area and lateral surface area of the pyramid?
Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 56 cm^2**
✗ **B. 100 cm^2**
✗ **C. 128 cm^2**
✓ **D. 196 cm^2**

(Problem ID: 22522) RADIO_BUTTON

No knowledge components have been assigned

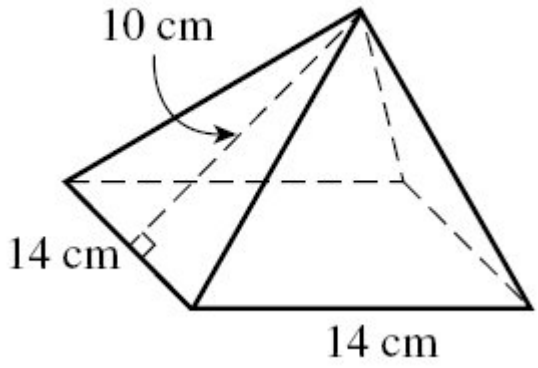
The total surface area is calculated by adding up all of the areas of the sides and bases. Not all of those areas are used when calculating the lateral surface area. What areas are *not* used to calculate the lateral surface area?
Answers: (Interface Type: RADIO_BUTTON)

✗ **A. The triangular faces**
✓ **B. The base(s)**
✗ **C. Half of the triangular faces**
✗ **D. All of the triangular faces and base(s) are used**

Hint 1:
By definition, the lateral surface area does not include the areas of the bases.
Hint 2:
Choose B

(Problem ID: 22532) RADIO_BUTTON

No knowledge components have been assigned



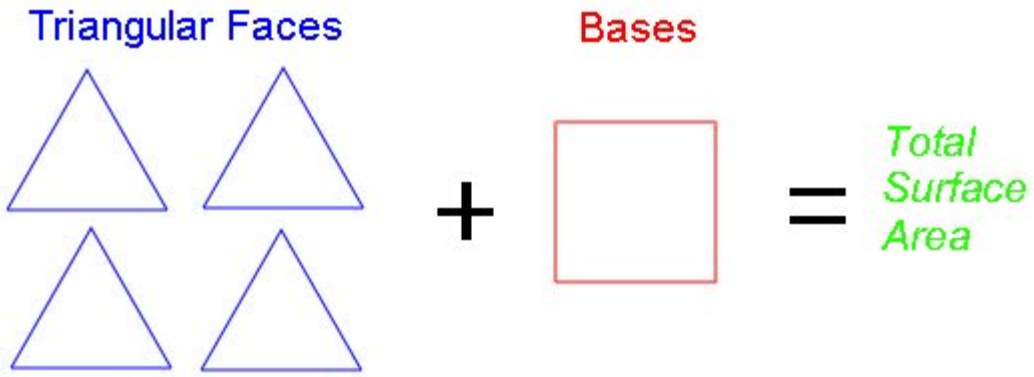
We now know that the only difference between calculating total surface area and lateral surface area is the area of the bases.

So for the pyramid, what is the difference between the total surface area and lateral surface area?

Answers: (Interface Type: RADIO_BUTTON)

- ✗ **A. 56 cm^2**
- ✗ **B. 100 cm^2**
- ✗ **C. 128 cm^2**
- ✓ **D. 196 cm^2**

Hint 1:



Above is a look at the triangular faces and bases of the pyramid individually. Notice:

lateral surface area + area of base = total surface area

We want to know the area of the base since it is the difference between the total surface area and the lateral surface area

Hint 2:

From the original picture, we can see that the base is a square and has sides of length 14. Calculate the area of this square.

Hint 3:

14*14 = 196. Choose D

26.) "2005m_13_gr10_calc" (Problem ID: 22064) RADIO_BUTTON

No knowledge components have been assigned

Denise poured milk into a glass shaped like a right circular cylinder with a radius of 2 inches. When she added chocolate syrup to the milk, the height of the liquid in the glass increased by 1/2 inch. What was the volume of the chocolate syrup that Denise added to the glass of milk?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 1/2π cu. in.
✗ B. π cu. in.
✓ C. 2π cu. in.
✗ D. 4π cu. in

(Problem ID: 22502) RADIO_BUTTON

No knowledge components have been assigned

$$A.\ V = \pi \cdot 2^2 \cdot \frac{1}{2}$$

$$B.\ V = \frac{4}{3} \cdot \pi \cdot 2^3$$

$$C.\ V = \pi \cdot 4$$

$$D.\ V = \pi \cdot \frac{1}{2}^2 \cdot 2$$

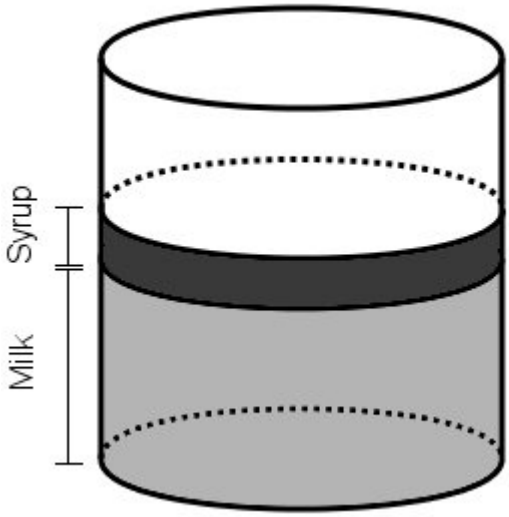
Start by drawing a sketch. (Pretend that the syrup does not mix with the milk and just floats at the top of the glass)

Which of the above equations will solve for the volume of the syrup?

Answers: (Interface Type: RADIO_BUTTON)

✓ A
✗ B
✗ C
✗ D

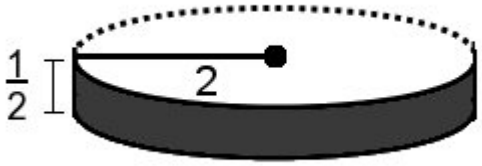
Hint 1:



A sketch of the glass is shown above.

Recall from your reference sheet that the volume of a right cylinder is:
$V = \pi \cdot r^2 \cdot h$

Find the radius and height of the volume of the syrup.
Hint 2:



As the syrup was added, the height of the liquid is increased by 1/2. This is height of the syrup. The radius of the volume of the syrup is the same as the glass, 2.

Substitute these values into the equation for the volume of a right cylinder.
Hint 3:
$V = \pi \cdot 2^2 \cdot (1/2)$ is the equation. Select choice A

(Problem ID: 22503) RADIO_BUTTON

No knowledge components have been assigned
Using the equation we just found, solve for the volume of the syrup.

Answers: (Interface Type: RADIO_BUTTON)
✗ A. $1/2\pi$ cu. in.
✗ B. π cu. in.
✓ C. 2π cu. in.
✗ D. 4π cu. in

Hint 1:

$V = \pi \cdot 2^2 \cdot (1/2)$
Start by simplifying 2^2
Hint 2:
$2^2 = 2 \cdot 2 = 4$
$V = \pi \cdot 4 \cdot (1/2)$

Now, multiply 4 by 1/2
Hint 3:
$4 \cdot (1/2) = 2$
$V = \pi \cdot 2$

Select answer choice C.

27.) "2005m_35_gr10_nocalc" (Problem ID: 22063) RADIO_BUTTON

No knowledge components have been assigned

A swimming pool in the shape of a right circular cylinder is 18 feet in diameter and 6 feet high.

If it is filled with water to a height of 4 feet, which of the following is closest to the volume of water in the pool?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 1018 cubic feet**
✗ **B. 1527 cubic feet**
✗ **C. 4072 cubic feet**
✗ **D. 6107 cubic feet**

(Problem ID: 22500) RADIO_BUTTON

No knowledge components have been assigned

A. $V = \frac{4}{3} \cdot \pi \cdot 6^3$

B. $V = \pi \cdot 9^2 \cdot 4$

C. $V = \pi \cdot 18^2 \cdot 6$

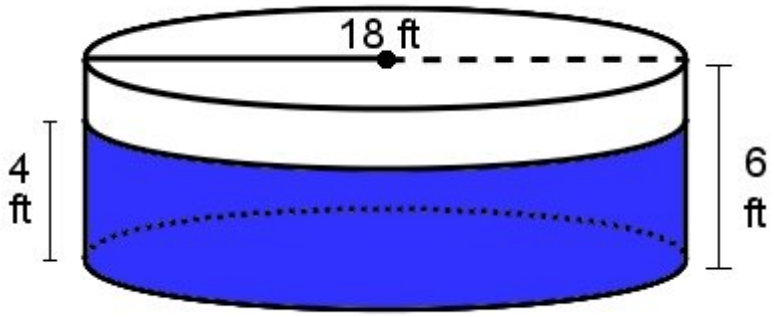
D. $V = \pi \cdot 9^2 \cdot 6$

Start by drawing a sketch of the swimming pool, a right cylinder, and fill in the different values.

Determine which of the equations above solves for V, the volume of the water in the pool.
Answers: (Interface Type: RADIO_BUTTON)
✗ **A**
✓ **B**
✗ **C**

✕ D

Hint 1:



A sketch of the pool is shown above. The volume of the water of the pool can be computed using the formula for the volume of a right cylinder.

Hint 2:

Refer to your reference sheet for the volume of a right cylinder. It is shown here:

$V = \pi \cdot r^2 \cdot h$

Fill in the values for the radius, r, and height, h.

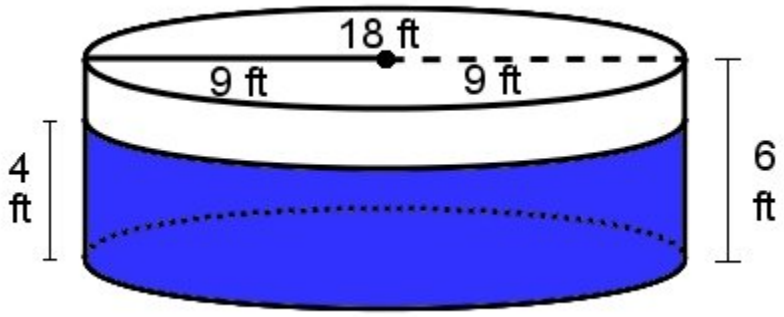
Hint 3:

Make sure you usethe height of the water, and not the pool. The height is given as 4. Substitute 4 for the height

$V = \pi \cdot r^2 \cdot 4$

We are not given the radius, but we know it is half of the diameter.

Hint 4:



Half of the diameter, 18, is 9. Substitute 9 in for the radius.

$V = \pi \cdot 9^2 \cdot 4$

Answer choice B represents this equation. Choose B.

(Problem ID: 22501) RADIO_BUTTON

No knowledge components have been assigned

The volume of the water in the pool can be calculated by the formula we found:

$V = \pi 9^2(4)$

Which of the following answer choices is closest to the volume of the water?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 1018 cubic feet**

✗ **B. 1527 cubic feet**

✗ **C. 4072 cubic feet**

✗ **D. 6107 cubic feet**

Hint 1:

π to 5 decimal places is 3.14159. Since we are choosing the value closest to the volume of the pool, we can approximate π as 3 to make the calculations easier.

Our new equation is then:

$V = 3 \cdot 9^2 4$

Simplify the equation. Start by simplifying 9^2

Hint 2:

$9^2 = 81$

Now,

$V = 3 \cdot 81 \cdot 4$

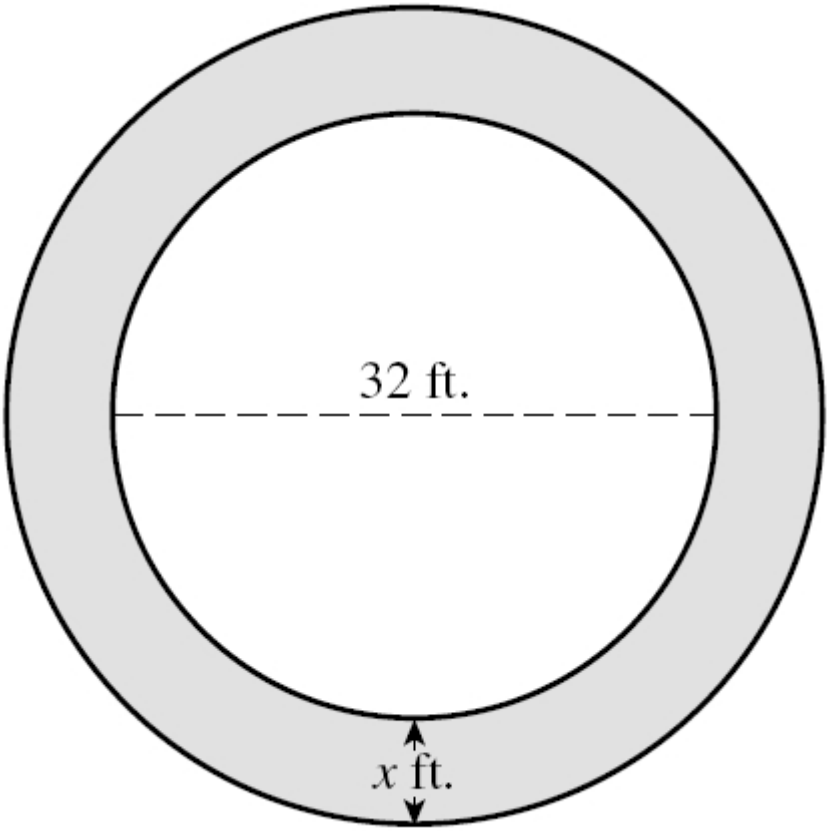
Hint 3:

$3 \cdot 81 \cdot 4 = 972$

972 is closest to answer choice A, 1018. Choose A.

28.) "2005_29_gr10" (Problem ID: 21899) RADIO_BUTTON

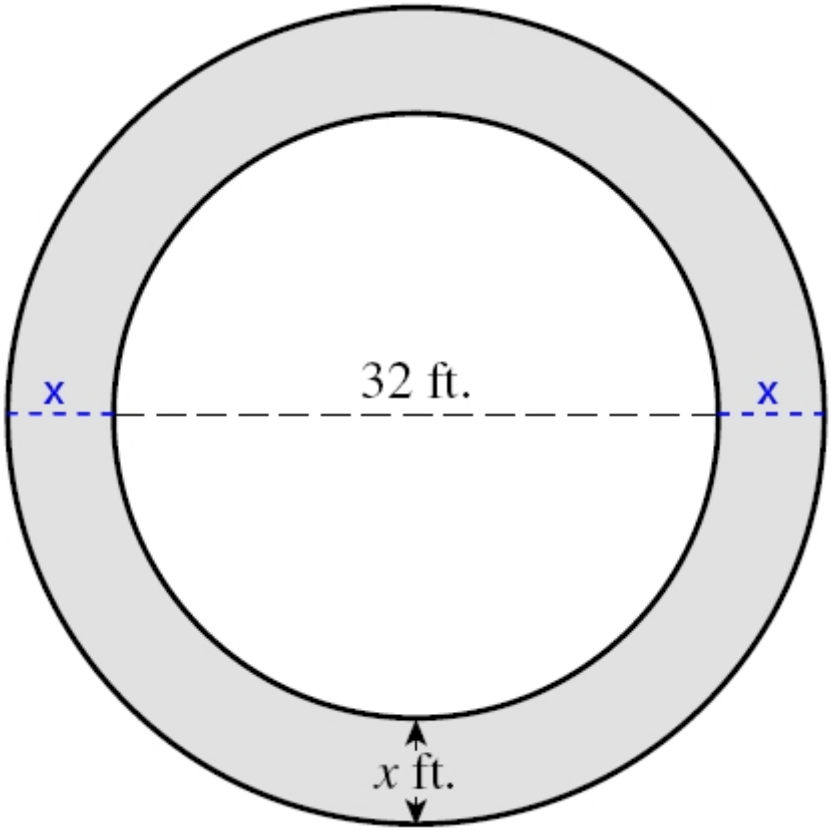
No knowledge components have been assigned



A circular pool with a diameter of 32 feet is surrounded by a wood deck of uniform width.

If the area of the deck is 68π square feet, what is x, the width of the deck?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 0.5 ft.**
✗ **B. 1.0 ft.**
✗ **C. 1.5 ft.**
✓ **D. 2.0 ft.**

(Problem ID: 21920) ALGEBRA_FIELD
No knowledge components have been assigned



The sketch in the original problem can be seen as two circles with one circle inside of the larger circle. The area of the deck is the difference of the area of the two circles. An equation will look like this:

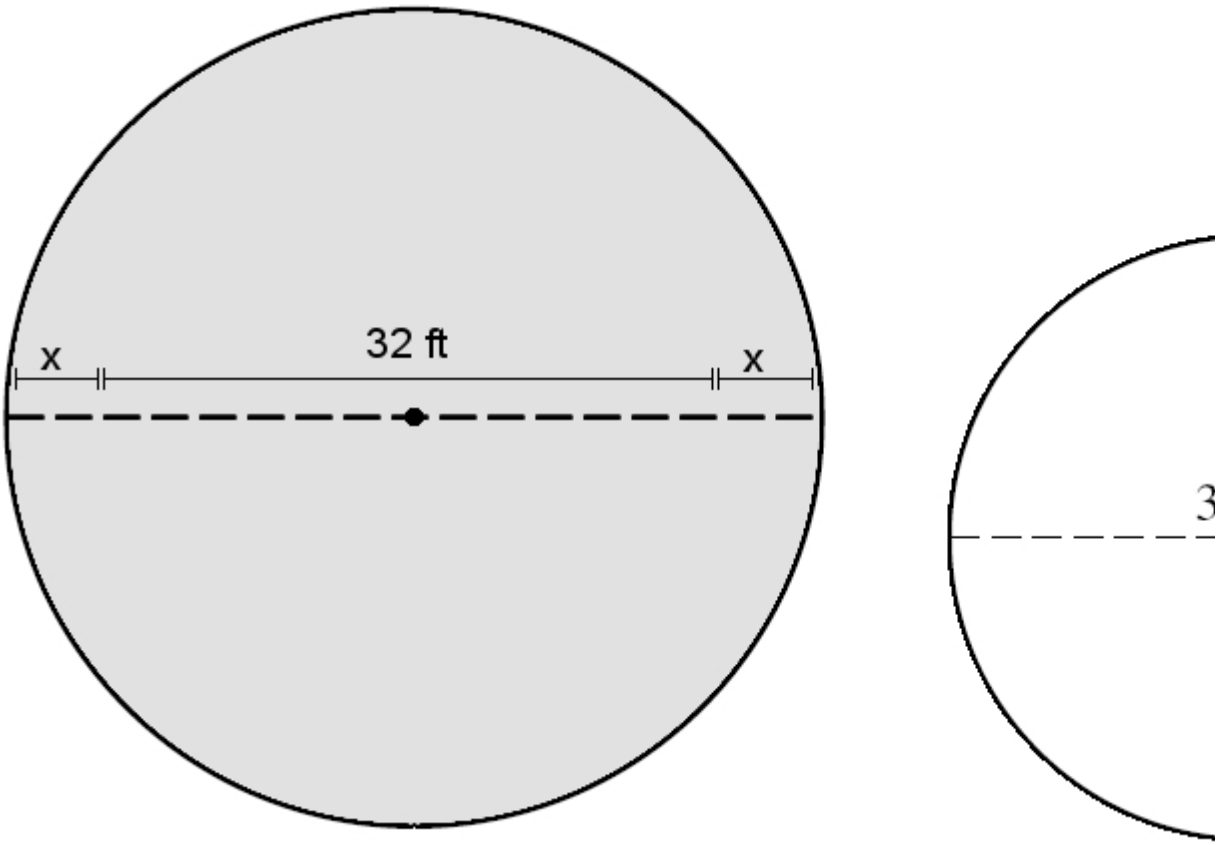
Area of the deck = Area of the larger circle - Area of the smaller circle

The diameter of the smaller circle is given as 32. Using the picture above, write an expression for the diameter of the large circle.

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **32 + 2x**

Hint 1:



It may help to look at the two circles side by side.
Hint 2:
You can see the diameter of the larger circle is the diameter of the smaller circle plus x on both sides.

In other words, the diameter is x + 32 + x or 32 + 2x
Please enter 32 + 2x

(Problem ID: 21940) RADIO_BUTTON

No knowledge components have been assigned

We now know the diameters of both of the circles. As we stated earlier, the equation is: area of the deck = area of the larger circle - area of the smaller circle

We know the area of the deck to be 68π, we need to know the areas of the circles. Which of the following equations correctly represents all of the areas and the relationships between them?

Answers: (Interface Type: RADIO_BUTTON)

✗ **A. $68\pi = \pi (32 + 2x)^2 - \pi 32^2$**
✗ **B. $68\pi = 32\pi - (32 + 2x)\pi$**
✗ **C. $68\pi = (16 + x)\pi - 16\pi$**
✓ **D. $68\pi = \pi(16 + x)^2 - \pi 16^2$**

Hint 1:
Recall from your reference sheet that the area of a circle is:
$A = \pi r^2$

We know the diameters of the circles, but we need to know the radii.
Hint 2:
The radius of a circle is half of its diameter.
Remember, the diameters of the circles are:
$d_{large} = 32 + 2x$
$d_{small} = 32$
Hint 3:
The radii of the circles are:
$r_{large} = 16 + x$
$r_{small} = 16$

Now substitute these radii into the formulas for the area of a circle.
Hint 4:
The areas of the circles are:
$A_{large} = \pi(16+x)^2$
$A_{small} = \pi(16)^2$
Hint 5:
Substitute those areas into the original equation:
Area of the deck = area of the larger circle – area of the smaller circle

Therefore, the relationship between the areas is:
$68\pi = \pi(16 + x)^2 - \pi16^2$
Please select D.

(Problem ID: 21941) RADIO_BUTTON

No knowledge components have been assigned
Now, we can solve for x using the equation we just found.
$68\pi = \pi(16 + x)^2 - \pi16^2$
Solve for x
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 0.5 ft.**
✗ **B. 1.0 ft.**
✗ **C. 1.5 ft.**
✓ **D. 2.0 ft.**

Hint 1:
Start by expanding the term $(16 + x)^2$ and then grouping like terms on one side of the equation.
Hint 2:
$(16 + x)^2 = 16^2 + 32x + x^2$

Now put this result back into the equation:
$68\pi = \pi(16^2 + 32x + x^2) - \pi16^2$

After distributing the π across $(16^2 + 32x + x^2)$
$68\pi = 16^2\pi + 32x\pi + x^2\pi - \pi16^2$

Now, combine like terms.
Hint 3:
$68\pi = (16^2\pi - 16^2\pi) + 32x\pi + x^2\pi$
$68\pi = x^2\&pi + 32x\pi$

We have a quadratic equation. To solve it, subtract 68π from both sides of the equation. This will make the left side zero and then we can factor.
Hint 4:
$68\pi - 68\pi = x^2\&pi + 32x\pi - 68\pi$
$0 = x^2\&pi + 32x\pi - 68\pi$

Now we can factor the equation.
Hint 5:
$0 = (x + 34)(x - 2)$
So, x = -34 or 2.
Since -34 does not make sense for the width, 2 is the only other option for x. So the value of x, the width of the deck, is 2. Select D.

29.) "2005m_26_gr10" (Problem ID: 21884) RADIO_BUTTON

No knowledge components have been assigned

A circular rug has a diameter of 6.5 feet. Which of the following is closest to the area of the rug?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 33 square feet**
✗ **B. 66 square feet**
✗ **C. 104 square feet**
✗ **D. 133 square feet**

(Problem ID: 21885) RADIO_BUTTON

No knowledge components have been assigned

Which of the following expressions calculates the area, A, of the circular rug?

Answers: (Interface Type: RADIO_BUTTON)

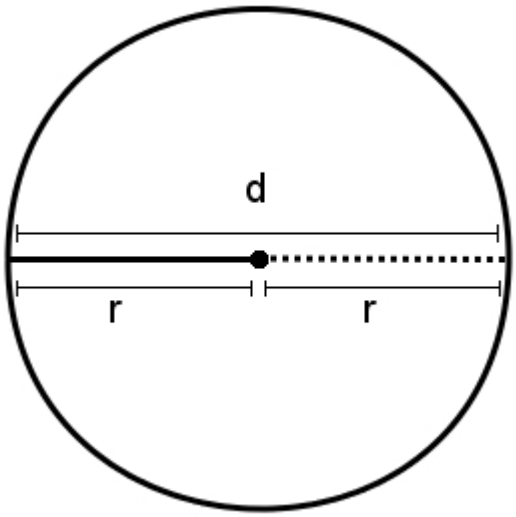
✗ **A. $A = 2\cdot\pi\cdot3.25$**
✓ **B. $A = \pi\cdot3.25^2$**
✗ **C. $A = \pi\cdot6.5^2$**
✗ **D. $A = \pi\cdot6.5$**

Hint 1:
The rug is circular. This means that we can represent the rug as a circle.

Recall from your reference sheet that the formula for the area of a circle is:
$A = \pi\cdot r^2$
(r is the radius of the circle)

Hint 2:
We know the diameter, but need to know the radius to solve for the area.

Hint 3:



The circle above shows the relationship between the diameter and the radius. The radius is half of the diameter.

Solve for the radius.
Hint 4:
Half of the diameter, 6.25, is 3.25. So, the radius is 3.25. Now we can substitute that back into our formula.

$$A = \pi(3.25)^2$$

The answer is B.
Hint 5:
The radius is 3.25. Now we can substitute that back into our formula.

$$A = \pi(3.25)^2$$

The answer is B.

(Problem ID: 21900) RADIO_BUTTON

No knowledge components have been assigned

We can now solve the original question using the formula we just found. Which of the following is closest to the area of the rug?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 33 square feet**
✗ **B. 66 square feet**
✗ **C. 104 square feet**
✗ **D. 133 square feet**

Hint 1:
Recall the formula we found previously:
$A = \pi(3.25)^2$
We need to solve for A.

The question asks us to find the closest value from the choices above. Since we don't need to be exact, we can approximate some of the values to make the calculations easier.
Hint 2:
π out to the first 5 decimal places is 3.14159, but we can approximate π by just 3.

Our formula is now:
$A = 3(3.25)^2$

Let's also round 3.25 to 3. Our new equation is:
$A = 3(3)^2$

We only need to know approximately what the solution is and select the choice that is closest. This equation makes the calculations easier and is accurate enough for us to make the selection. To get the estimation, start by simplifying the term with the exponent.
Hint 3:
$(3)^2$ **is** $3 \cdot 3 = 9$

So,
$A = 3(9)$
Multiply 3 by 9

Hint 4:
$3(9) = 27$

This is very close to answer choice A, 33. Select A.

End Linear Section
nd Linear Section

Module Name: 10thGradeMZ-ALL

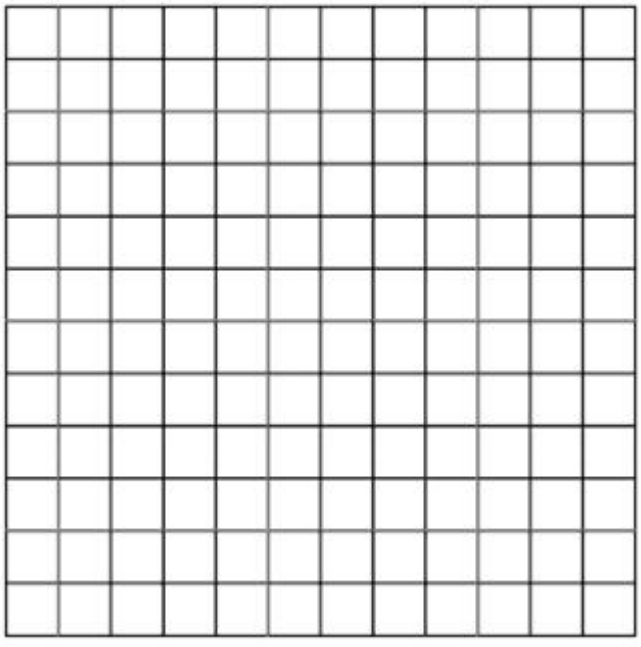
Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Random Order Section

1.) "2003_7_10_s (2006/08/30 21:12:31)" (Problem ID: 12800) RADIO_BUTTON [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



On the coordinate plane, what is the distance between the points **(3, 4)** and **(11, 10)**?

Answers: (Interface Type: RADIO_BUTTON)

✓ **10**

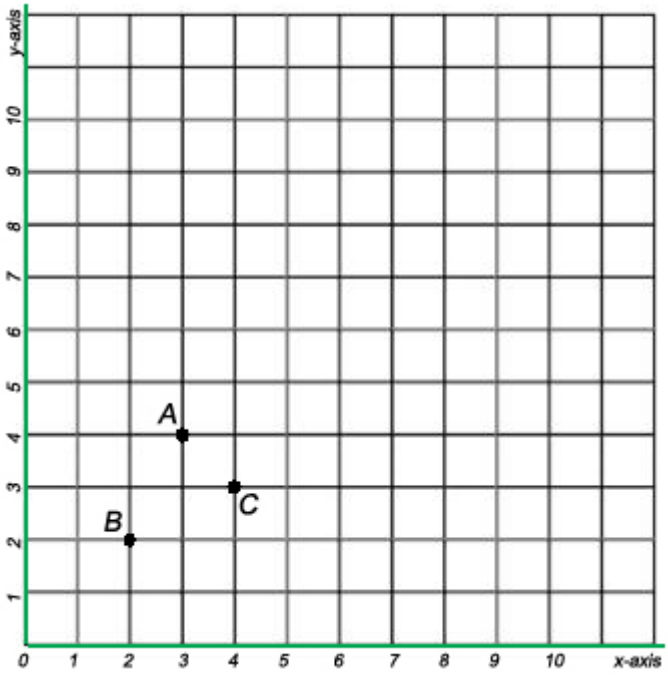
✗ 14

✗ 5

✗ 7

(Problem ID: 12801) RADIO_BUTTON [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



To make sense of this problem, you can start by drawing a picture. Lets start by plotting the point (3, 4). Here is the x and y axis, which of the points is (3, 4)?

Answers: (Interface Type: RADIO_BUTTON)

✗ B

✗ C

✓ **A**

Hint 1:

The x-coordinate of (3,4) is 3.

Hint 2:

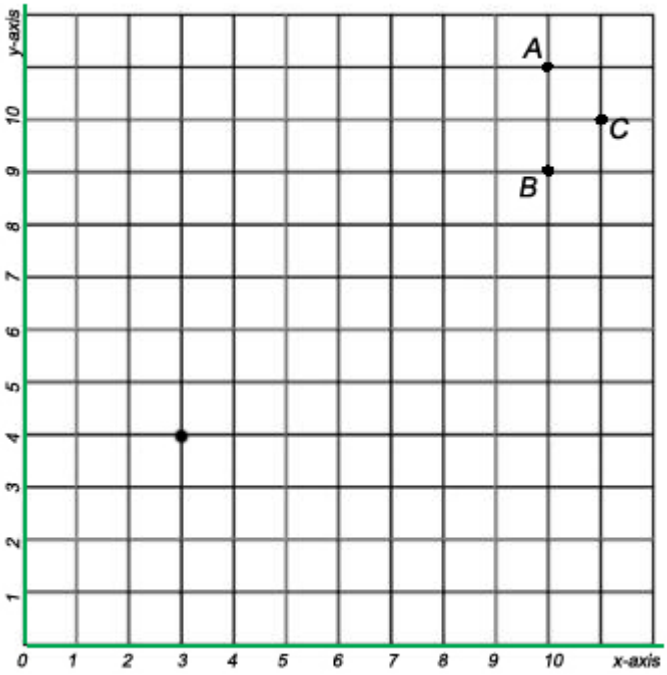
The y-coordinate of (3,4) is 4.

Hint 3:

The correct answer is 'A'. Please enter/select 'A' (without quotes).

(Problem ID: 12802) RADIO_BUTTON [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



Let's continue and plot (11, 10). Which of the points is (11, 10)?

Answers: (Interface Type: RADIO_BUTTON)

✗ A

✗ B

✓ **C**

Hint 1:

The x-coordinate of (11, 10) is 11.

Hint 2:

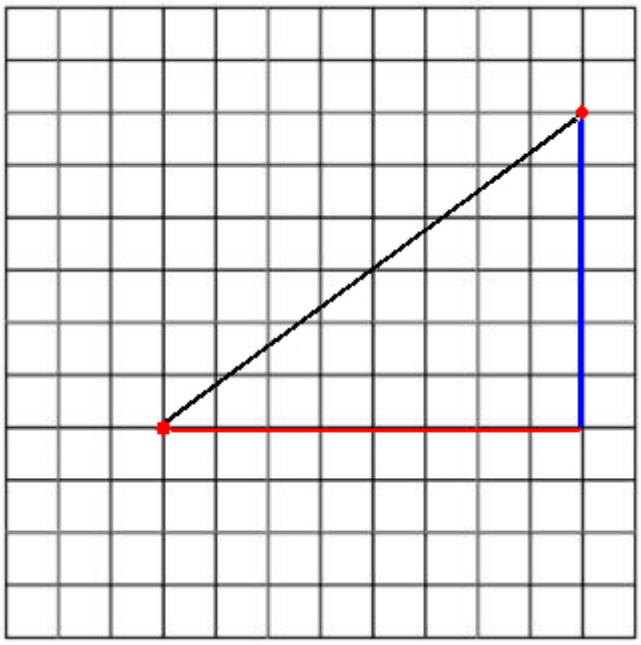
The y-coordinate of (11, 10) is 10.

Hint 3:

The correct answer is 'C'. Please enter/select 'C' (without quotes).

(Problem ID: 12803) TEXT_FIELD [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



The distance between two points can be found by finding the length of the hypotenuse of the triangle shown. To do this we need to use the Pythagorean Theorem, and in order to use that we need the lengths of the two legs. What is the length of the red triangle leg parallel to the x-axis?

Answers: (Interface Type: TEXT_FIELD)

✓ **8**

✗ 6 *Sorry, that's incorrect. Did you find the length of the red triangle leg parallel to the x-axis?*

Hint 1:
The length of the red triangle leg parallel to the x-axis is the difference between the x-components of the coordinates (**3**, 4) and (**11**, 10).
Hint 2:
What is 11 – 3?
Hint 3:
The length of the red triangle leg is '8'. Please enter/select '8' (without quotes).

(Problem ID: 12804) TEXT_FIELD [MA - 2003 - SPRING - 7]

No knowledge components have been assigned

What is the length of the blue triangle leg parallel to the y-axis?

Answers: (Interface Type: TEXT_FIELD)

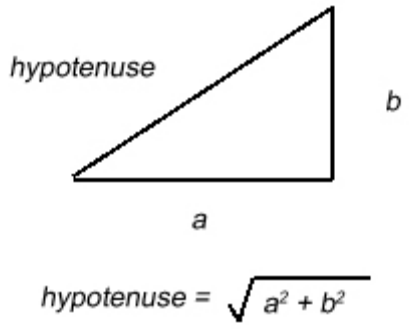
✓ **6**

✗ 8 *Sorry, that's incorrect. Did you find the length of the blue triangle leg parallel to the y-axis?*

Hint 1:
The length of the blue triangle leg parallel to the y-axis is the difference between the y-components of the coordinates (3, **4**) and (11, **10**).
Hint 2:
What is 10 – 4?
Hint 3:
The length of the blue triangle leg is '6'. Please enter/select '6' (without quotes).

(Problem ID: 12805) TEXT_FIELD [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



Now that we have the lengths of **a** and **b**, we can use the Pythagorean Theorem. What is the length of the hypotenuse?

Answers: (Interface Type: TEXT_FIELD)

✔ **10**

✘ 100 *Remember to take the square root after you sum the squares.*

Hint 1:

$\sqrt{8^2 + 6^2}$

false

Hint 2:

$\sqrt{100}$

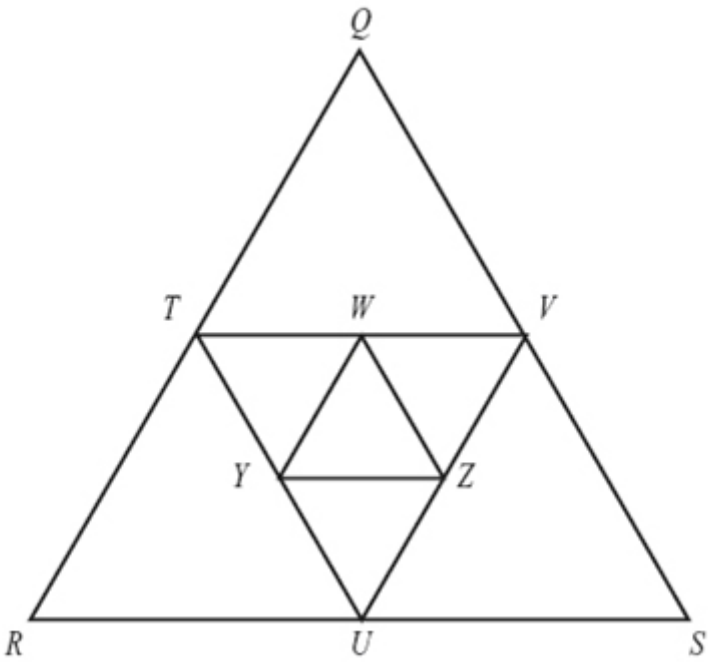
false

Hint 3:

The correct answer is '10'. Please enter/select '10' (without quotes).

2.) "2003_9_10_s (2006/09/07 00:56:55)" (Problem ID: 12609) RADIO_BUTTON [MA - 2003 - SPRING - 9]

No knowledge components have been assigned



In the figure shown below, triangle TUV is formed by joining the midpoints of the sides of the equilateral triangle QRS. Triangle WYZ is formed by joining the midpoints of the sides of triangle TUV.

If the area of triangle QRS is 64 square inches, what is the area of triangle WYZ?
Answers: (Interface Type: RADIO_BUTTON)
✗ 1 square inch
✗ 16 square inches
✓ **4 square inches**
✗ 8 square inches

(Problem ID: 12610) TEXT_FIELD [MA - 2003 - SPRING - 9]

No knowledge components have been assigned

Because the triangle TUV is constructed from the midpoints of QRS, QRS is split into four equal triangles including TUV. The area of triangle TUV is 1/4 of the area of triangle QRS. And since WYZ is similarly constructed from the midpoints of TUV, the area of WYZ is 1/4 of the area of triangle TUV. So let's start by finding the area of TUV. What is the area of TUV?
Answers: (Interface Type: TEXT_FIELD)
✓ **16**

Hint 1:
What is 1/4 of 64?
Hint 2:
What is 64 * 1/4?
Hint 3:
The correct answer is '16'. Please enter/select '16' (without quotes).

(Problem ID: 12611) TEXT_FIELD [MA - 2003 - SPRING - 9]

No knowledge components have been assigned

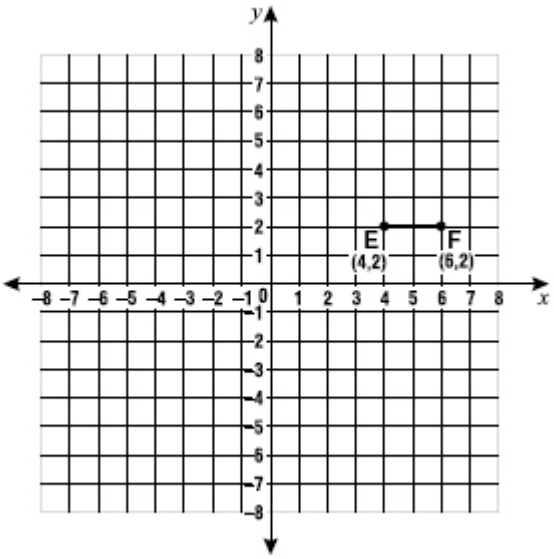
Now that we've found the area of triangle TUV, we can find the area of triangle WYZ. What

is the area of WYZ?
Answers: (Interface Type: TEXT_FIELD)
✓ **4**

Hint 1:
The area of triangle WYZ is 1/4 of the area of triangle TUV.
Hint 2:
What is 16 * 1/4?
Hint 3:
The correct answer is '4'. Please enter/select '4' (without quotes).

3.) "2003_33_10_s (2006/08/30 21:30:32)" (Problem ID: 12478) RADIO_BUTTON [MA - 2003 - Spring - 33]

No knowledge components have been assigned



The diagram above shows the location of EF on a coordinate plane.Suppose that EF is rotated 180 degrees clockwise about the origin. What are the coordinates of the image of point E?
Answers: (Interface Type: RADIO_BUTTON)
✗ (-2, -4)
✓ **(-4, -2)**
✗ (4, -2)
✗ (-4, 2)

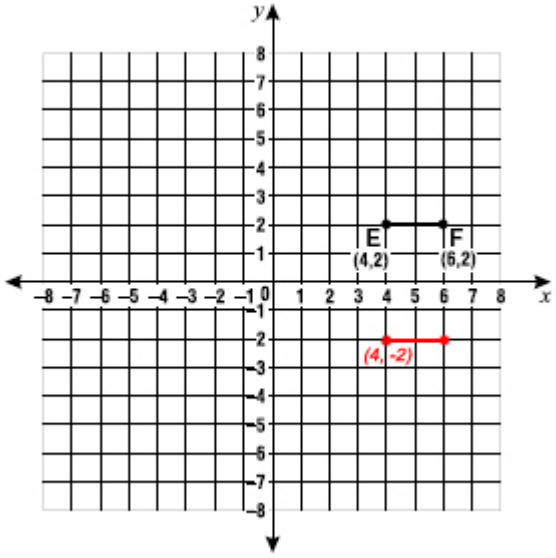
(Problem ID: 12479) RADIO_BUTTON [MA - 2003 - Spring - 33]

No knowledge components have been assigned

A 180 degree rotation of an image around the origin can be found by doing a reflection across **both** the x-axis and the y-axis. What are the coordinates of the image of point E after reflecting across the x-axis?
Answers: (Interface Type: RADIO_BUTTON)
✓ **(4, -2)**
✗ (-4, 2)
✗ (-2, 4)
✗ (-4, -2)

Hint 1:

To find the reflection across the x-axis, imagine folding the coordinate plan along the x-axis.
Hint 2:



In order to reflect a coordinate across the x-axis, multiply the y-coordinate by -1.
Hint 3:
The correct answer is '(4, -2)'. Please enter/select '(4, -2)' (without quotes).

(Problem ID: 12480) RADIO_BUTTON [MA - 2003 - Spring - 33]

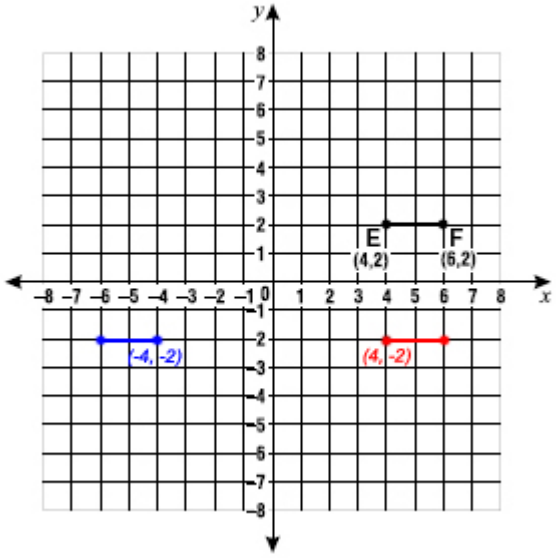
No knowledge components have been assigned

Starting from after the reflection across the x-axis, what are the coordinates of the image of point E after reflecting across the y-axis?

Answers: (Interface Type: RADIO_BUTTON)

✗ (-2, 4)
✗ (4, -2)
✓ **(-4, -2)**
✗ (-4, 2)

Hint 1:
To find the reflection across the y-axis, imagine folding the coordinate plan along the y-axis.
Hint 2:



In order to reflect a coordinate across the y-axis, multiply the x-coordinate by -1.
Hint 3:
The correct answer is '(-4, -2)'. Please enter/select '(-4, -2)' (without quotes).

4.) "2001.11.10.geo.s" (Problem ID: 15269) TEXT_FIELD [MA - 2001 - Spring - 11]

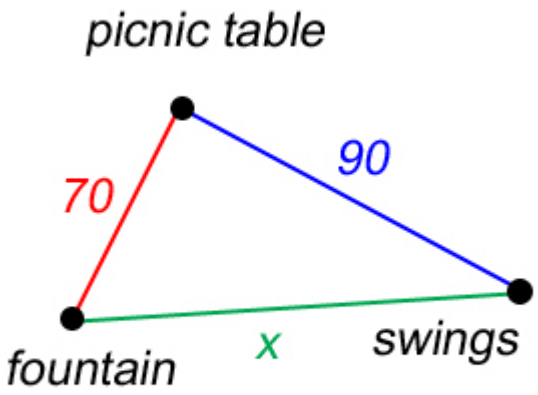
No knowledge components have been assigned

In Oak Park, a picnic table is located 70 feet from the water fountain and 90 feet from the swings. What is the longest possible distance that the water fountain could be from the swings?

Answers: (Interface Type: TEXT_FIELD)
✓ **160**

(Problem ID: 15271) TEXT_FIELD [MA - 2001 - Spring - 11]

No knowledge components have been assigned

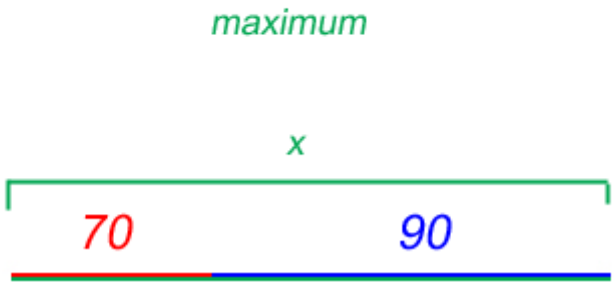


Start by drawing a picture! In this question, there are three locations: the picnic table, the water fountain, and the swings.

If we think of each location as a corner of a triangle, then we have the lengths of two sides of the triangle, 70 and 90.

Let the third side represent the distance from the water fountain to the swing. What is the shortest the third side of the triangle formed by the three locations can be?
Answers: (Interface Type: TEXT_FIELD)
✓ **20**

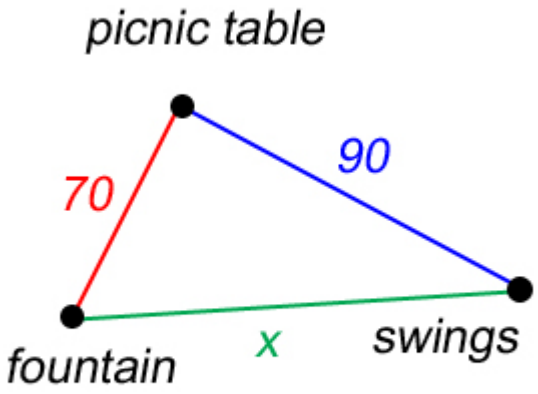
Hint 1:



Take a look at the animation above.
The red length represents the distance from the picnic table to the water fountain.
The blue length represents the distance from the picnic table to the swings.
The green length represents the distance from the water fountain to the swings.
Hint 2:
As you can see, the green length reaches its minimum length when the red and blue lengths are overlapping.
Hint 3:
The minimum length of the green line is the difference of the red and blue segments.
Hint 4:
The minimum distance from the water fountain to the swings is 90 - 70.
Hint 5:
90 - 70 = 20
Type in 20.

(Problem ID: 15270) TEXT_FIELD [MA - 2001 - Spring - 11]

No knowledge components have been assigned



Start by drawing a picture! In this question, there are three locations: the picnic table, the water fountain, and the swings.

If we think of each location as a corner of a triangle, then we have the lengths of two sides of

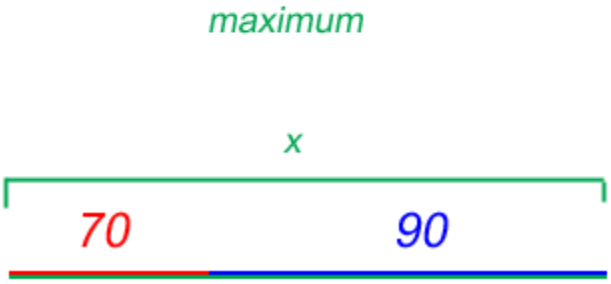
the triangle, 70 and 90.

Let the third side represent the distance from the water fountain to the swing. What is the longest the third side of the triangle formed by the three locations can be?

Answers: (Interface Type: TEXT_FIELD)

✔ **160**

Hint 1:



Take a look at the animation above.
The red length represents the distance from the picnic table to the water fountain.
The blue length represents the distance from the picnic table to the swings.
The green length represents the distance from the water fountain to the swings.

Hint 2:

As you can see, the green length reaches its maximum length when the red and blue lengths are put end to end.

Hint 3:

The maximum length of the green line is the sum of the red and blue segments.

Hint 4:

The maximum distance from the water fountain to the swings is 70 + 90.

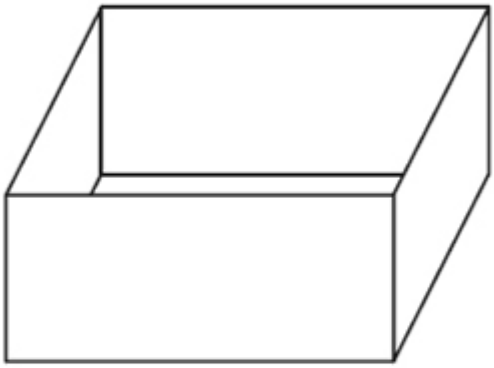
Hint 5:

70 + 90 = 160
Type in 160.

5.) "2003.re.35.10.me.s" (Problem ID: 15129) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Jennifer keeps a box under her bed to store clothes. The box is in the shape of a rectangular prism as shown in the figure below.



Jennifer's sister, Molly, made a box that had the same height as Jennifer's box. Molly, however, realized that she could triple the length and double the width and it would still fit under her bed.

What is the ratio of the volume of Molly's box to the volume of Jennifer's box?

Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 6 : 1**
✗ B. 12 : 1
✗ C. 36 : 1
✗ D. 216 : 1

(Problem ID: 15130) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

First, let's find the volume of a rectangular prism. Which of the following completes the equation for the volume of a rectangular prism V = _____.

Answers: (Interface Type: RADIO_BUTTON)
✗ l * (w + h)
✓ **l * w * h**
✗ l / w / h
✗ $l^2 * w^2 * h^2$

Hint 1:
Refer to your reference sheet for the formula for the volume of a rectangular prism.

Hint 2:
The formula for the volume of a rectangular prism is: l * w * h

(Problem ID: 15274) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Next, let's find the volume of a rectangular prism whose length has been tripled and width has been doubled. Which of the following completes the equation for the volume of such a rectangular prism V = _____.

Answers: (Interface Type: RADIO_BUTTON)

✗ l * w * h
✗ (l + 3) * (w + 2) * h
✗ 2^3 * l * w * h
✓ **6 * l * w * h**

Hint 1:
The normal volume of a rectangular prism is l * w * h.
Substitute l in the equation with 3l.
Substitute w in the equation with 2w.
Hint 2:
(3l) * (2w) * h
Hint 3:
3 * l * 2 * w * h
Hint 4:
3 * 2 * l * w * h
Hint 5:
6 * l * w * h
The volume of a rectangular prism whose length is tripled and width is doubled is 6 * l * w * h.

(Problem ID: 15275) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Jennifer's box has a volume of:
l * w * h

Molly's box which has the same height as Jennifer's box, but triple the length and double the width has a volume of:
6 * l * w * h

What is the ratio of the volume of Molly's box to the volume of Jennifer's box?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 6 : 1**
✗ B. 12 : 1
✗ C. 36 : 1
✗ D. 216 : 1

Hint 1:
Find the ratio between the volume of Molly's box and the volume of Jennifer's box.
Hint 2:

$$ratio = \frac{6 * l * w * h}{1 * l * w * h}$$

Hint 3:

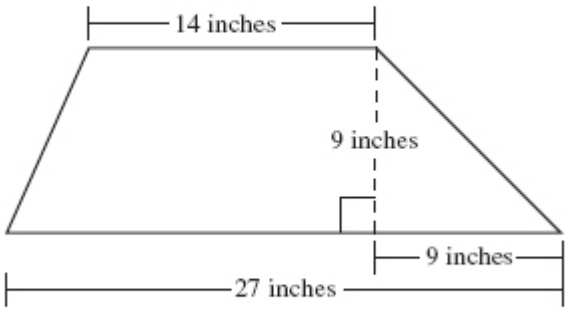
$$ratio = \frac{6 * \cancel{l} * \cancel{w} * \cancel{h}}{1 * \cancel{l} * \cancel{w} * \cancel{h}}$$

Hint 4:
The ratio between the volume of Molly's box to the volume of Jennifer's box is **A. 6 : 1.**

6.) "2003.re.34.10.me.s" (Problem ID: 15124) RADIO_BUTTON [MA - 2003 - NOV - 34]

No knowledge components have been assigned

The trapezoid pictured below has the measurements shown.

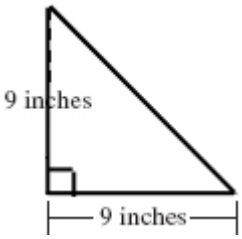


Which measure is closest to the perimeter of the trapezoid?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 41 inches
✗ B. 59 inches
✓ **C. 64 inches**
✗ D. 66 inches

(Problem ID: 15125) TEXT_FIELD [MA - 2003 - NOV - 34]

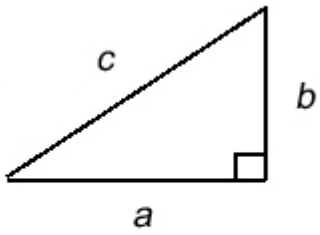
No knowledge components have been assigned



To find the perimeter of the trapezoid, we need to find the lengths of the left and right sides. Let's start by taking a look at the right side. The image above shows the right side of the trapezoid. Using the Pythagorean Theorem, we can find the length of the right side.

What is the length of the right side of the trapezoid rounded to the nearest whole number?
Answers: (Interface Type: TEXT_FIELD)
✓ **13**

Hint 1:

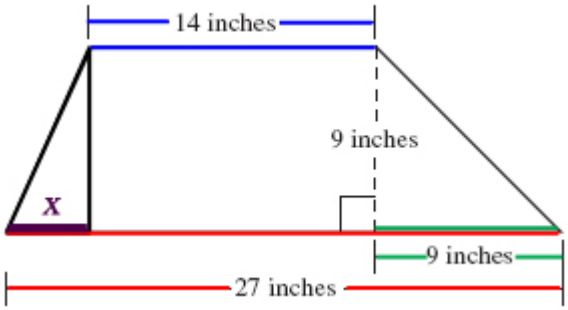


$a^2 + b^2 = c^2$

The Pythagorean Theorem is shown in the image above.
You can also refer to your reference sheet for the Pythagorean Theorem.
Hint 2:
a? + b? = c?
9? + 9? = c?
Hint 3:
81 + 81 = c?
c? = 162
Hint 4:
c = √162
The square root of 162 is 12.72, which rounded to the nearest whole number is 13. Type in 13.

(Problem ID: 15126) TEXT_FIELD [MA - 2003 - NOV - 34]

No knowledge components have been assigned



To find the perimeter of the trapezoid, we need to find the lengths of the left and right sides.

Using the Pythagorean Theorem, we can find the length of the left side. In order to do that, we need to find the length of the base of the triangle on the left.

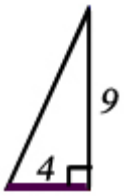
What is the length of the base of the triangle on the left, **x**?
Answers: (Interface Type: TEXT_FIELD)
✔ **4**

Hint 1:
The x is equal to the base of the trapezoid minus the top of the trapezoid and the base of the triangle on the right.
Hint 2:
x = 27 - (14 + 9)

Hint 3:
x = 27 - 23
Hint 4:
The length of the base of the triangle on the left, **x**, is 4.
Type in 4.

(Problem ID: 15127) TEXT_FIELD [MA - 2003 - NOV - 34]

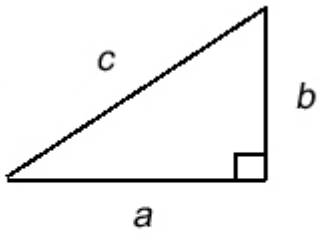
No knowledge components have been assigned



To find the perimeter of the trapezoid, we need to find the lengths of the left and right sides. The image above shows the left side of the trapezoid. Using the Pythagorean Theorem, we can find the length of the left side.

What is the length of the left side of the trapezoid rounded to the nearest whole number?
Answers: (Interface Type: TEXT_FIELD)
✔ **10**

Hint 1:

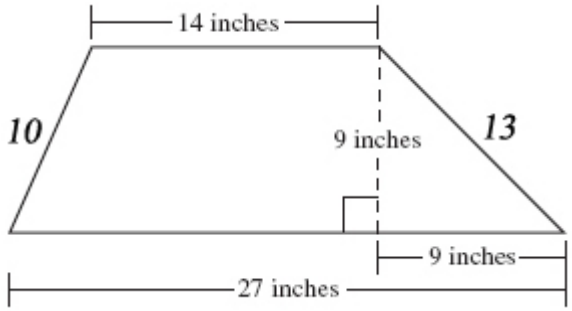


$a^2 + b^2 = c^2$

The Pythagorean Theorem is shown in the image above.
You can also refer to your reference sheet for the Pythagorean Theorem.
Hint 2:
a? + b? = c?
4? + 9? = c?
Hint 3:
$16 + 81 = c^2$
$97 = c^2$
Hint 4:
$c = \sqrt{97}$
The square root of 97 is 9.85, which rounded to the nearest whole number is 10.
Type in 10.

(Problem ID: 15128) RADIO_BUTTON [MA - 2003 - NOV - 34]

No knowledge components have been assigned



Now that we know the lengths of the left and right sides are 10 and 13 respectively, we can find the perimeter of the trapezoid by adding up the lengths of each side.
How many inches is the perimeter of the trapezoid?

Answers: (Interface Type: RADIO_BUTTON)

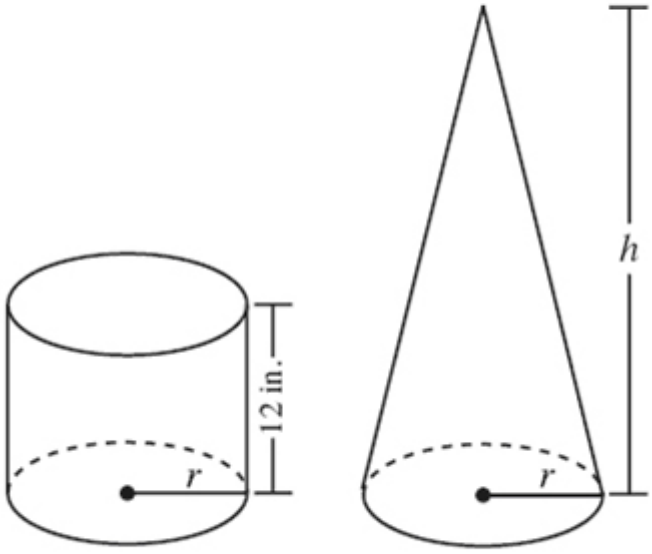
✗ A. 41 inches
✗ B. 59 inches
✓ **C. 64 inches**
✗ D. 66 inches

Hint 1:
Perimeter = 10 + 13 + 14 + 27
Hint 2:
Perimeter = 23 + 14 + 27 Perimeter = 37 + 27
Hint 3:
Perimeter = 64
Choose answer choice C. 64 inches

7.) "2003.re.12.10.me.s" (Problem ID: 15116) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

The right cylinder and right cone shown below have the same radius and volume. The cylinder has a height of 12 inches.



What is *h*, the height of the cone?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 18 inches
✗ B. 24 inches
✓ **C. 36 inches**
✗ D. 42 inches

(Problem ID: 15117) RADIO_BUTTON [MA - 2003 - NOV - 12]

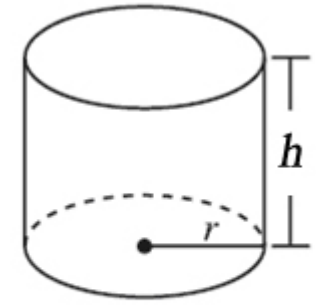
No knowledge components have been assigned

Using the fact that the volume of the right cylinder and right cone are equal, we can construct an equation to solve for h.

First we need to find the volume of the **right cylinder**. Which of the following expressions represents the volume of the **right cylinder**?

Answers: (Interface Type: RADIO_BUTTON)
✗ $\pi r * 12$
✗ πr^2
✓ **$\pi r^2 * 12$**
✗ $12\pi^2 r$

Hint 1:



Volume of a Right Cylinder =

$$\pi r^2 * h$$

The equation for the volume of a right cylinder is shown above.
You can also refer to your reference sheet for the equation for the volume of a right cylinder.
Hint 2:
The height of the cylinder is 12. Substitute the 12 into the equation for h, the height.
Hint 3:
The volume of this cylinder = $\pi r^2 * 12$
Choose answer choice $\pi r^2 * 12$.

(Problem ID: 15118) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

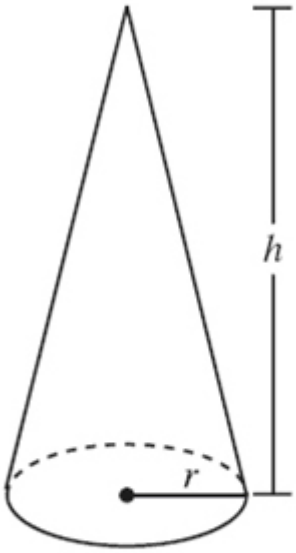
Using the fact that the volume of the right cylinder and right cone are equal, we can construct an equation to solve for h.

Now that we have the volume of the right cylinder, we need to find the volume of the **right cone**. Which of the following expressions represents the volume of the **right cone**?

Answers: (Interface Type: RADIO_BUTTON)

✗ $1/3\ \pi^2r^2 * h$
✗ $1/3\ \pi r^2$
✓ **$1/3\ \pi r^2 * h$**
✗ $1/3\ \pi r * h$

Hint 1:



Volume of a Right Cone

$$\frac{1}{3}\pi r^2 h$$

The equation for the volume of a right cone is shown above.
You can also refer to your reference sheet for the equation for the volume of a right cone.
Hint 2:
Choose answer choice 1/3 πr² * h.

(Problem ID: 15119) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned
Now we can set up an equation equating the volumes of the two objects.
πr? * 12 = 1/3 πr? * h

What is *h*, the height of the cone?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 18 inches
✗ B. 24 inches
✓ **C. 36 inches**
✗ D. 42 inches

Hint 1:
πr? * 12 = 1/3 πr? * h
πr? * 12 / r?= 1/3 πr? * h / r?
π * 12 = 1/3 π * h
Hint 2:
π * 12 / π= 1/3 π * h / π
12 = 1/3 * h
Hint 3:
12 * 3= 1/3 * h * 3
12 * 3 = h
h = 36
Choose answer choice C. 36 inches.

8.) "2002.re.29.10.me.s" (Problem ID: 15112) RADIO_BUTTON [MA - 2002 - FALL - 29]

No knowledge components have been assigned

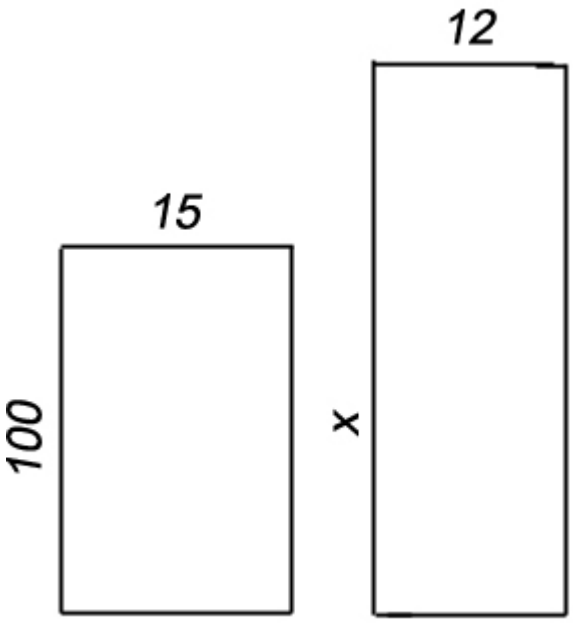
Thomas is installing a 100-foot-long roll of a 15-foot-wide piece of carpet. Thomas located a roll of similar carpeting that was 12 feet wide. How many feet of the 12-foot-wide roll of carpeting does Thomas need to equal the area of the 15-foot-wide roll of carpeting?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 80 feet
✗ B. 112 feet
✓ **C. 125 feet**
✗ D. 154 feet

(Problem ID: 15113) TEXT_FIELD [MA - 2002 - FALL - 29]

No knowledge components have been assigned



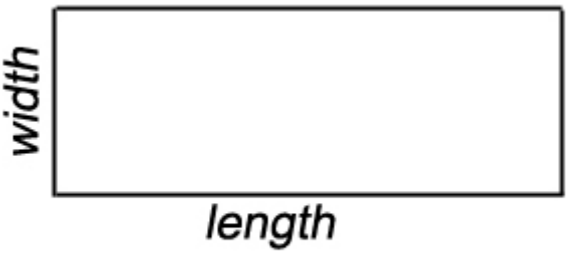
The image above shows what we know about the dimensions of the two pieces of carpet. In order to solve this problem, we're going to use the fact that the two pieces of carpet need to have the same area. First, we must find their area.

How many square feet is the piece of carpet that is 15 feet wide and 100 feet long.?

Answers: (Interface Type: TEXT_FIELD)

✓ **1500**

Hint 1:

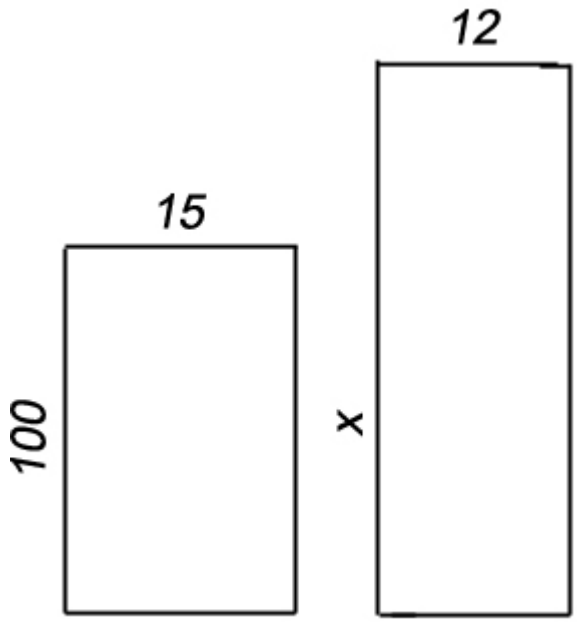


*Area of a Rectangle = width * length*

The equation for the area of a rectangle is shown above.
You can also refer to your reference sheet for the equation for the area of a rectangle.
Hint 2:
Since the carpet is a rectangle with width 15 and height 100, the equation for its area is:
A = 15 * 100
Hint 3:
A = 1500
The area of this piece of carpet is 1500. Type in 1500.

(Problem ID: 15114) RADIO_BUTTON [MA - 2002 - FALL - 29]

No knowledge components have been assigned



The image above shows what we know about the dimensions of the two pieces of carpet. In order to solve this problem, we're going to use the fact that the two pieces of carpet need to have the same area. Since we have found the area of one of them, we need to find the area of the other.

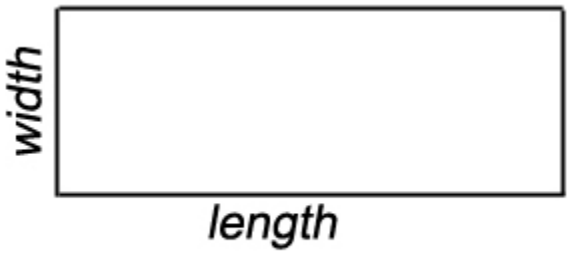
Which of the following expressions represents the area of the piece of carpet that is 12 feet wide?

Answers: (Interface Type: RADIO_BUTTON)

✓ **12x**

✗ 12 + x
✗ 24 + 2x
✗ 24x

Hint 1:



*Area of a Rectangle = width * length*

The equation for the area of a rectangle is shown above.
You can also refer to your reference sheet for the equation for the area of a rectangle.
Hint 2:
This carpet has a width of 12 and a height of x. Substitute these values into the equation for the area of a rectangle.
Hint 3:
The area of the carpet is 12x.
Choose answer choice 12x.

(Problem ID: 15115) RADIO_BUTTON [MA - 2002 - FALL - 29]

No knowledge components have been assigned

Since we know that the area of the two carpets must be equal, we can set up an equation by equating the two areas we have found.
12x = 1500
The value of x is the length required for the 12 foot wide carpet to have the same area as the 15 foot wide carpet.
How many feet of the 12 foot wide carpet does Thomas need to equal the area of the 15 foot wide carpet?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 80 feet
✗ B. 112 feet
✓ **C. 125 feet**
✗ D. 154 feet

Hint 1:
12x = 1500
12x / 12 = 1500 / 12
x = 1500 / 12
Hint 2:
x = 125
Choose answer choice C. 125 feet.

9.) "2003.re.1.10.me.s" (Problem ID: 15109) RADIO_BUTTON [MA - 2003 - NOV - 1]

No knowledge components have been assigned

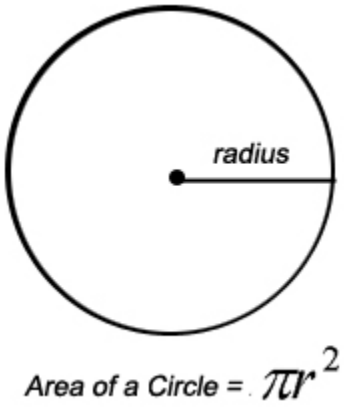
A landing pad for a helicopter is in the shape of a circle with a radius of 7 meters. Which of the following is closest to the area of the landing pad?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 44 square meters
✓ **B. 154 square meters**
✗ C. 205 square meters
✗ D. 308 square meters

(Problem ID: 15110) RADIO_BUTTON [MA - 2003 - NOV - 1]

No knowledge components have been assigned

First, we need to set up an equation for the area of the landing pad. Which of the following equations can be solved to find the area of the landing pad, **A**?
Answers: (Interface Type: RADIO_BUTTON)
✓ **$A = \pi * 7^2$**
✗ $A = 2 * \pi * 7$
✗ $A = \pi^2 * 7$
✗ $A = 7\pi$

Hint 1:



The equation for the area of a circle is shown above.
You can also refer to your reference sheet for the equation for the area of a circle.
Hint 2:
The radius of the landing pad is given to be 7 feet. Substitute the radius variable **r** in the equation with 7.
Hint 3:
$A = \pi * r^2$
$A = \pi * 7^2$
Choose answer choice $A = \pi * 7^2$

(Problem ID: 15111) RADIO_BUTTON [MA - 2003 - NOV - 1]

No knowledge components have been assigned

Now that we have the equation for the area of the landing pad
$A = \pi * 7^2$
Solve for A to find the area of the landing pad.

Which of the following is closest to the area of the landing pad?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 44 square meters

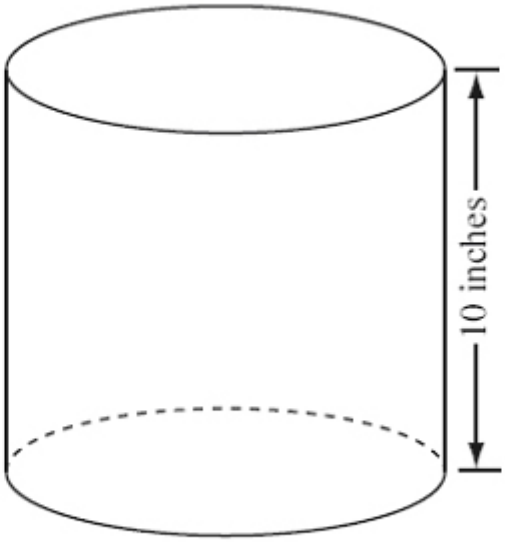
✓ **B. 154 square meters**
✗ C. 205 square meters
✗ D. 308 square meters

Hint 1:
$A = \pi * 7^2$
$A = 3.14 * 7^2$
Hint 2:
$A = 3.14 * 49$
Hint 3:
$A = 153.86$
The area of the landing pad is closest to 154 square meters. Choose answer choice B.

10.) "2002.re.14.10.me.s" (Problem ID: 14876) RADIO_BUTTON [MA - 2002 - FALL - 10]

No knowledge components have been assigned

The right cylinder shown below has a height of 10 inches. The base of the cylinder has a circumference of 6π inches.



What is the lateral surface area of the cylinder?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 30π square inches
✓ **B. 60π square inches**
✗ C. 90π square inches
✗ D. 360π square inches

(Problem ID: 14877) RADIO_BUTTON [MA - 2002 - FALL - 10]

No knowledge components have been assigned

The height of the cylinder is 10 inches. The circumference of the base is 6π inches.

Which of the choices completes the equation for the lateral surface area SA = _____.
Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 6π * 10**
✗ B. 6π / 10
✗ C. $6\pi^2$ * 10
✗ D. 60

Hint 1:
The formula for the Lateral Surface Area of a Cylinder is:
Lateral Surface Area = Circumference * height
You can also refer to your reference sheet for the formula for the Lateral Surface Area of a Cylinder.
Hint 2:
The circumference is given to be 6π and the height is 10. Substitute the values into the formula.
Hint 3:
The correct answer is 6π * 10. Choose answer choice A.

(Problem ID: 14878) RADIO_BUTTON [MA - 2002 - FALL - 10]

No knowledge components have been assigned
Now that we have the equation for the lateral surface area:
LSA = 6π * 10
Solve for the lateral surface area. What is the lateral surface area?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 30π square inches
✓ **B. 60π square inches**
✗ C. 90π square inches
✗ D. 360π square inches

Hint 1:
6π * 10 can also be written as 6 * 10 * π
Hint 2:
60π
The lateral surface area of the cylinder is 60π. Choose answer choice B.

11.) "2002.40.10.me.s" (Problem ID: 14872) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned
What is the effect on the circumference of a circle if the circle's radius is doubled?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. The circumference is multiplied by 2**
✗ B. The circumference is multiplied by 4
✗ C. The circumference is multiplied by 8
✗ D. The circumference stays the same

(Problem ID: 14873) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned
First, let's find out what the circumference of a circle is when the radius has not been doubled.
Which of the following completes the equation for the circumference of a circle **C** = _____.
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 2πr**
✗ B. 4πr

✗ C. πr^2
✗ D. πr

Hint 1:
Refer to your reference sheet for the formula for the circumference of a circle.
Hint 2:
The formula for the circumference of a circle is:
$C = 2\pi r$

(Problem ID: 14874) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned
Next, let's find the circumference of a circle whose radius has been doubled. Which of the following completes the equation for the circumference of a circle whose radius is doubled **C** = _____.
Answers: (Interface Type: RADIO_BUTTON)
✗ A. $2\pi r$
✗ B. πr
✗ C. $4\pi r^2$
✓ **D. $4\pi r$**

Hint 1:
The normal circumference of a circle is $2\pi r$. Substitute the value of r with twice the radius: $2r$.
Hint 2:
$2\pi(2r)$
Hint 3:
$2*2*\pi*r$
Hint 4:
$4\pi r$
The circumference of a circle whose radius is doubled is $4\pi r$. Choose answer choice D.

(Problem ID: 14875) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned
The circumference of a circle is:
$2\pi r$
The circumference of a circle whose radius is doubled is:
$4\pi r$
What is the effect on the circumference of a circle if the circle's radius is doubled?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. The circumference is multiplied by 2**
✗ B. The circumference is multiplied by 4
✗ C. The circumference is multiplied by 8
✗ D. The circumference stays the same

Hint 1:
Find the ratio between the circumference of the circle whose radius was doubled to the normal circle.
Hint 2:

$$ratio = \frac{4\pi r}{2\pi r}$$

Hint 3:

$$ratio = \frac{4\cancel{\pi}\cancel{r}}{2\cancel{\pi}\cancel{r}}$$

Hint 4:

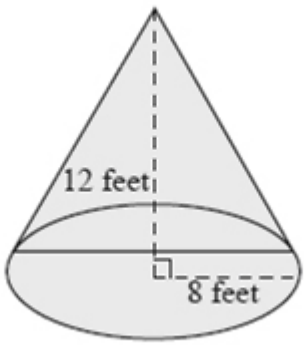
$$ratio = \frac{4}{2}$$

The πr is canceled out.
Hint 5:
ratio = 4 / 2 = 2
If the ratio between the two circumferences is 2, that means that **the circumference is multiplied by 2** when the radius is doubled.
Choose answer choice A.

12.) "2002.1.10.me.s" (Problem ID: 14869) RADIO_BUTTON [MA - 2002 - Spring - 1]

No knowledge components have been assigned

The cone shown below has a radius of 8 feet and a height of 12 feet.



What is the volume of the cone?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 32π cubic feet
✓ **B. 256π cubic feet**
✗ C. 374π cubic feet
✗ D. 768π cubic feet

(Problem ID: 14870) RADIO_BUTTON [MA - 2002 - Spring - 1]

No knowledge components have been assigned

The radius of the cone is given to be 8, and the height of the cone is 12. Using this information, set up an equation to solve for the volume.

Complete the equation for the volume of the cone **V** = _____.

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 1/3 * π? * 8 * 12
✓ **B. 1/3 * π * 8? * 12**
✗ C. 1/2 * π * 8 * 12
✗ D. 1/3 * π * 8? * 12

Hint 1:
The formula for the volume of a cone is:
$V = 1/3 * \pi * r^2 * h$
You could also refer to your reference sheet for the formula.
Hint 2:
We know that the radius, **r**, is 8, and the height, **h**, is 12. Substitute the values for r and h in the formula.
Hint 3:
Substituting the values of r and h into the formula for the area of the cone gives you:
$1/3 * \pi * 8^2 * 12$
Choose answer choice B.

(Problem ID: 14871) RADIO_BUTTON [MA - 2002 - Spring - 1]

No knowledge components have been assigned

We now have an equation to solve for the volume of the cone:
$V = 1/3 * \pi * 8^2 * 12$
What is the volume of the cone?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 32π
✓ **B. 256π**
✗ C. 374π
✗ D. 768π

Hint 1:
To solve V = 1/3 * π * 8? * 12, start by following the order of operations. Remember that order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction.
Hint 2:
V = 1/3 * π * 64 * 12
Hint 3:
V = 1/3 * π * 768
Hint 4:
V = 768 * 1/3 * π
V = 768/3 * π
Hint 5:
V = 256π
The volume of the cone is 256π
Choose answer choice B.

13.) "2002.22.10.me.s" (Problem ID: 14866) RADIO_BUTTON [MA - 2002 - Spring - 22]

No knowledge components have been assigned

The rectangle shown below has a width of 2.5 feet and a perimeter of 13 feet.

What is the area of the rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 4 square feet
✗ B. 8 square feet
✓ **C. 10 square feet**
✗ D. 10.5 square feet

(Problem ID: 14867) TEXT_FIELD [MA - 2002 - Spring - 22]

No knowledge components have been assigned

To find the area of a rectangle, you need the length and width of the rectangle. The width and perimeter are given, what is the length of the rectangle?

Answers: (Interface Type: TEXT_FIELD)

✓ **4**

Hint 1:
You know that **perimeter = 2L + 2w**
Since the perimeter = 13 and w = 2.5, we have the equation:
13 = 2L + 2*2.5
Solve for L to find the length.
Hint 2:
13 = 2L + 5
Hint 3:
13 - 5 = 2L + 5 - 5
13 - 5 = 2L
8 = 2L
Hint 4:
8/2 = 2L/2
8/2 = L
L = 4
The length of the rectangle is 4. Type in 4.

(Problem ID: 14868) TEXT_FIELD [MA - 2002 - Spring - 22]

No knowledge components have been assigned

Now that you have the width and length of the rectangle, what is the area of the rectangle?

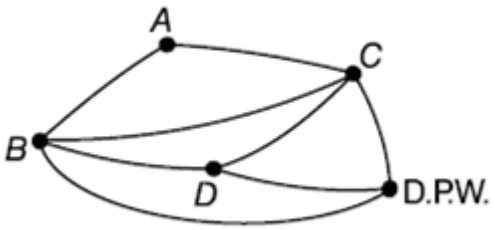
Answers: (Interface Type: TEXT_FIELD)

✓ **10**

Hint 1:
The area of a rectangle is equal to the width times the length. The width of the rectangle is 2.5, the length of the rectangle is 4.
Hint 2:
area = L * w
area = 2.5 * 4
Hint 3:
area = 10
The area of the rectangle is 10. Type in 10.

14.) "2001.23.10.geo.h" (Problem ID: 14865) RADIO_BUTTON [MA - 2001 - SPRING - 23]

No knowledge components have been assigned



Mr. Hendricks operates a snowplow for the Department of Public Works (D.P.W.). He found that he can

- begin snowplowing at the D.P.W.
- plow every street shown on the map above without going over any street more than once, and
- end at his home.

Where is his home located?

Answers: (Interface Type: RADIO_BUTTON)

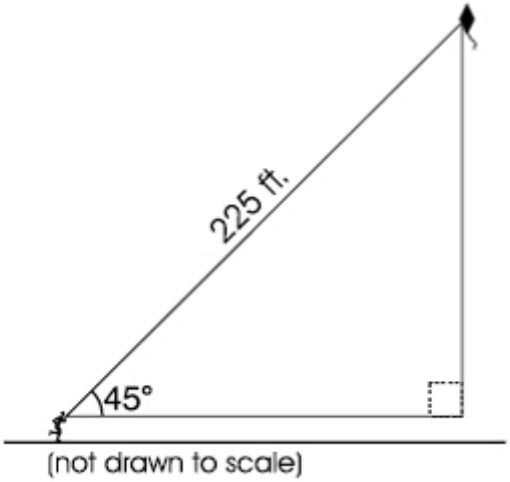
✗ A. at A
✗ B. at B
✗ C. at C
✓ **D. at D**

Hint 1:
A path that does not go over the same road more than once is called an **Eulerian Path**. An Eulerian Path exists if either all, or all but two, vertices have an even degree.

If there are two vertices with an odd degree, the Eulerian path starts on one of the odd degree vertices, and ends on the other.
Hint 2:
A vertex has an even degree if there are an even number of roads connected to it.
Hint 3:
Two of the points, D and D.P.W, have an odd number of paths connected to them.
Hint 4:
Since you start at the D.P.W, the only point you can end your Eulerian Path is the other point with an odd number of paths connected to it. That other point is point D.
Choose answer choice D.

15.) "2001.17.10.geo.s" (Problem ID: 14861) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned



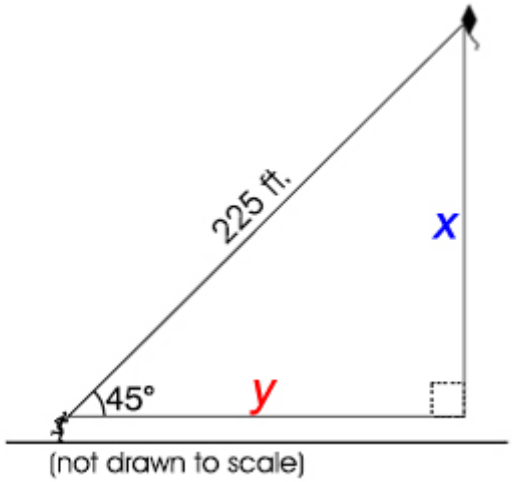
It is believed that the best angle to fly a kite is 45 degrees. If you fly a kite at this angle and let out 225 feet of string, **approximately** how high above the ground will the kite be?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 250 feet
✗ B. 200 feet
✓ **C. 150 feet**
✗ D. 100 feet

(Problem ID: 14862) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned



Let's label the length of the two sides y and x.

What is the relationship between y and x?

Answers: (Interface Type: RADIO_BUTTON)

✓ **y = x**
✗ y = x / 2
✗ y = 225 - x
✗ y = 2x

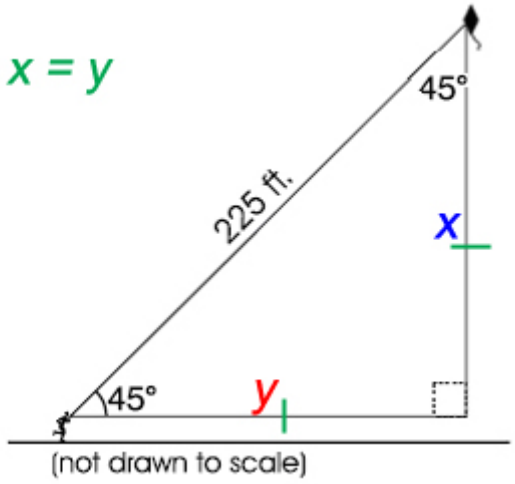
Hint 1:

The triangle has an angle of 45 degrees and an angle of 90 degrees. Think about the special kinds of triangles you know.

Hint 2:

This is a 45-45-90 triangle. If a right triangle has an angle of 45 degrees, then the third angle is also 45 degrees.

Hint 3:



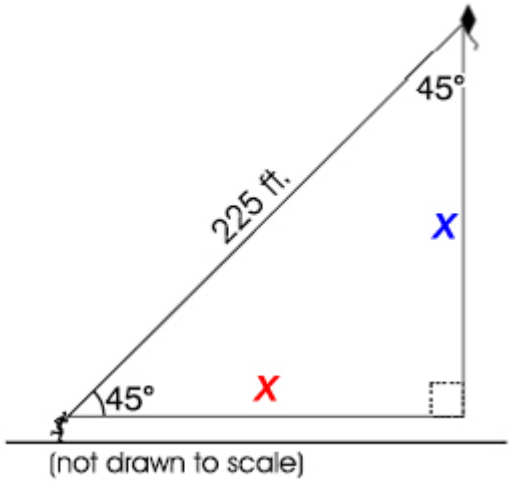
If a triangle has two angles of the same measure, it is an isosceles triangle. The sides opposite the congruent angles are also equal in length.

That means that the y = x.

Choose answer choice **D. x**

(Problem ID: 14863) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned



Now that we know the two legs of the triangle are congruent, we can setup an equation to solve for **x**, the kite's height. Which of the following equations is correct?

Answers: (Interface Type: RADIO_BUTTON)

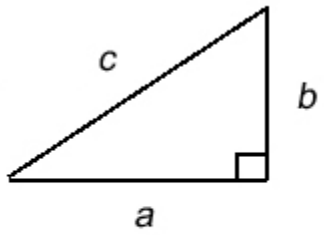
✓ **A. 225? = x? + x?**

✗ B. x? + 225? = x?

✗ C. 225? = x?

✗ D. x? = 225

Hint 1:
Since the triangle is a right triangle, we can use the Pythagorean Theorem.
Refer to your reference sheet for the Pythagorean Theorem.
Hint 2:



$a^2 + b^2 = c^2$

The Pythagorean Theorem is shown above. Substitute the appropriate values into the theorem.
Hint 3:
Since the two legs are both of length x, the equation is:
$225^2 = x^2 + x^2$
Choose answer choice A.

(Problem ID: 14864) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned

We have the equation $225^2 = x^2 + x^2$. To find **approximately** how high above the ground the kite will be, solve for **x** and choose the nearest answer choice.

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 250 feet
✗ B. 200 feet
✓ **C. 150 feet**
✗ D. 100 feet

Hint 1:
Start by taking the square of 225.
Hint 2:
225? = 50625
50625 = x? + x?
Hint 3:
50625 = 2 * x?
Simplify by dividing both sides by 2.
Hint 4:
50625 / 2 = 2 * x? / 2
50625 / 2 = x? 25312.5 = x?
Hint 5:
Now take the square root of 25312.5 to find the value of x. Then choose the answer choice closest to this value.
Hint 6:
The square root of 25312.5 is **approximately** 159. The closest answer choice is 150.
Choose answer choice **C. 150 feet.**

16.) "2001.8.10.geo.s" (Problem ID: 14857) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

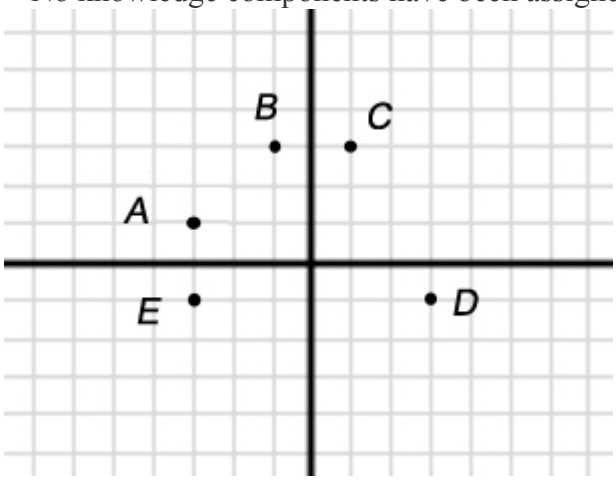
As the result of a transformation, the image of the point (-1,3) is (-3,1). This is an example of a reflection across the

Answers: (Interface Type: RADIO_BUTTON)

✗ A. line y = x
✓ **B. line y = -x**
✗ C. x-axis
✗ D. y-axis

(Problem ID: 14858) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned



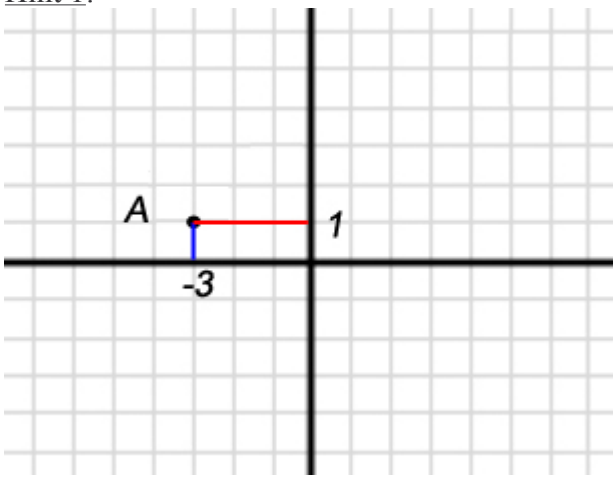
This is the type of problem where a sketch will help. Start by plotting the points!

Which pair of points in the image above are the two points given in the question?

Answers: (Interface Type: RADIO_BUTTON)

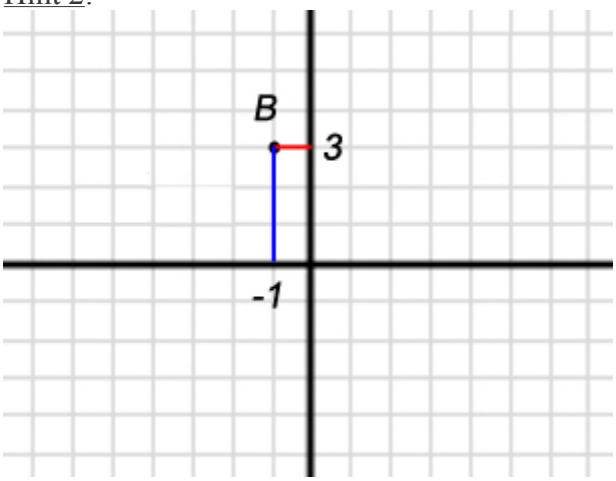
✗ D and A
✗ A and E
✗ C and E
✓ **A and B**

Hint 1:



The point A (-3, 1) is shown above. Notice how the red line shows that it is at 1 on the y-axis, and the blue line shows it is at -3 on the x-axis.

Hint 2:



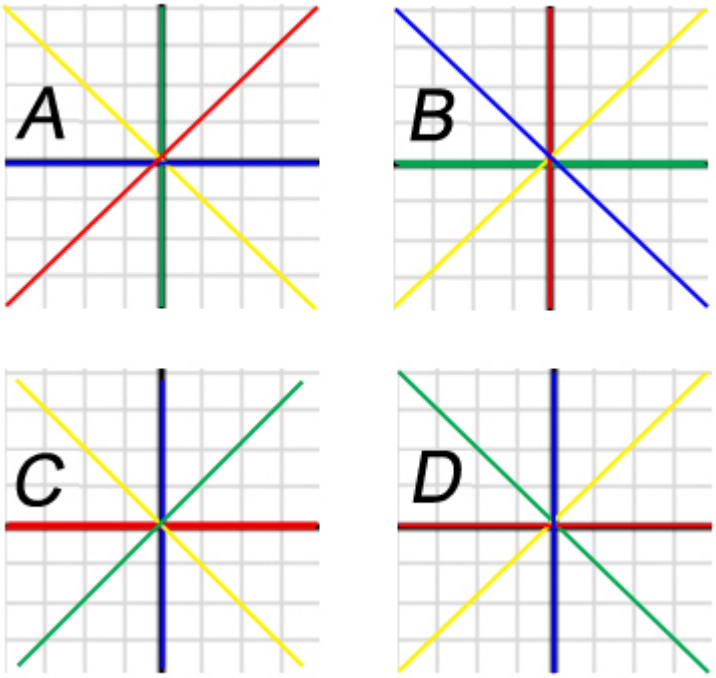
The point B (-1, 3) is shown above. Notice how the red line shows that it is at 3 on the y-axis, and the blue line shows it is at -1 on the x-axis.

Hint 3:

The two points that are given in the question are points A and B. Choose answer choice A and B.

(Problem ID: 14859) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned



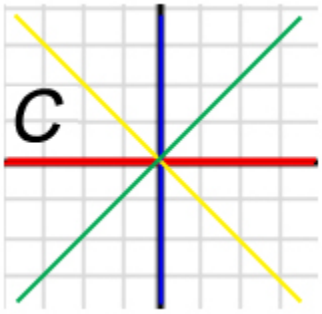
Which of the above images shows:

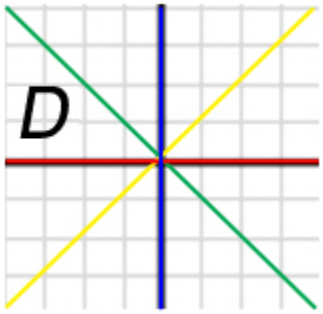
line y = x in green

line y = -x in yellow

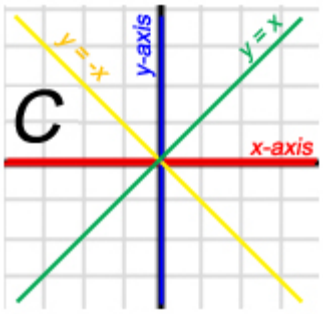
x-axis in red
y-axis in blue?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✓ **C**
✗ D

Hint 1:
Start by finding which of the answer choices has the x-axis and y-axis graphed correctly.
Hint 2:





Graphs C and D have the x-axis and y-axis graphed properly. Now which of these graphs has y = -x graphed correctly?
Hint 3:
y = -x is a line with a negative slope. That means that the the yellow line should be going from the top left to the bottom right.
Hint 4:



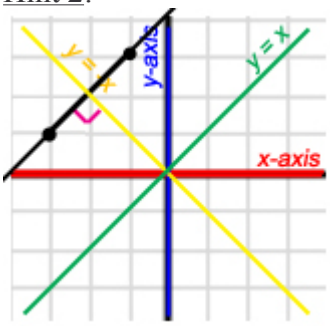
The graph that has all the lines graphed correctly is graph C. Choose answer choice C.

(Problem ID: 14860) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned
Now that we have plotted both of the points and all four of the answer choices, we can decide which line the point (-1, 3) was reflected across to get its image (-3, 1).

As the result of transformation, the image of the point (-1, 3) is (-3, 1). This is an example of reflection across the:
Answers: (Interface Type: RADIO_BUTTON)
✗ A. line y = x
✓ **B. line y = -x**
✗ C. x-axis
✗ D. y-axis

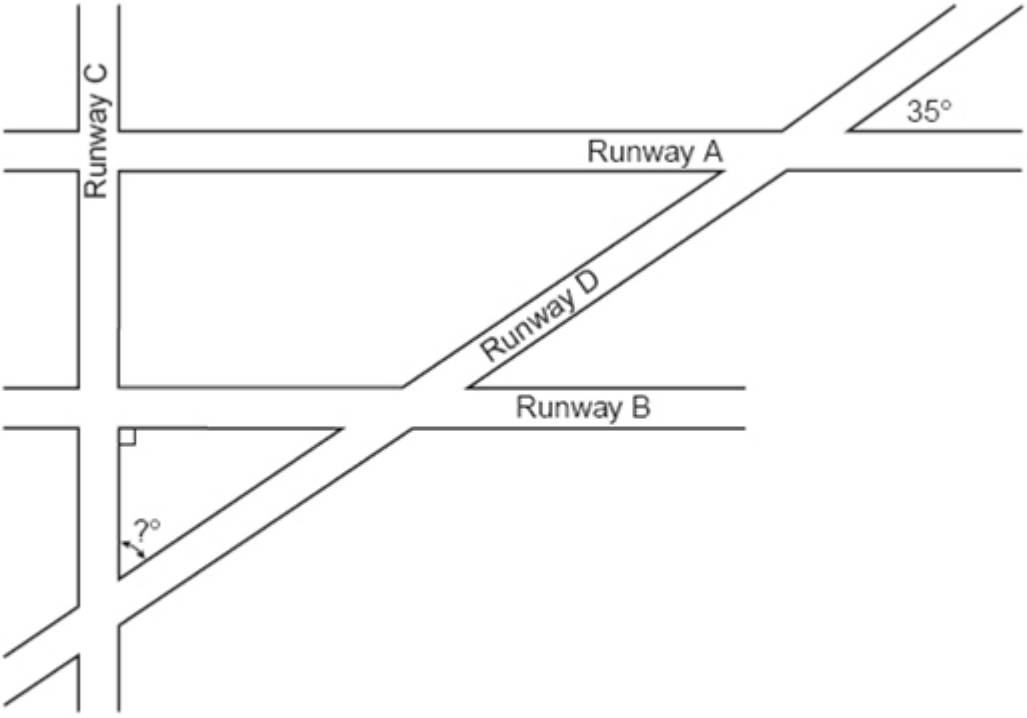
Hint 1:
A line drawn from a point to its reflected image is perpendicular to the line of reflection.
Hint 2:



Above is a picture showing the points, the lines of reflection, and the line passing through both the point and its image.
Hint 3:
The black line is perpendicular to the line y = -x.
Choose answer choice B.

17.) "2001.12.10.geo.s" (Problem ID: 14852) TEXT_FIELD [MA - 2001 - Spring - 12]

No knowledge components have been assigned

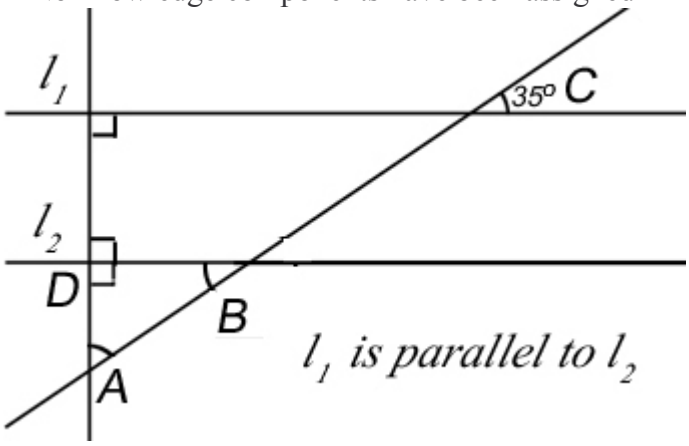


Runways A and B are parallel to each other and perpendicular to Runway C. If Runway D makes a 35° angle with Runway A as shown in the diagram, what is the measure of the angle marked in the diagram between Runways C and D?

Answers: (Interface Type: TEXT_FIELD)
✓ **55**

(Problem ID: 14853) TEXT_FIELD [MA - 2001 - Spring - 12]

No knowledge components have been assigned



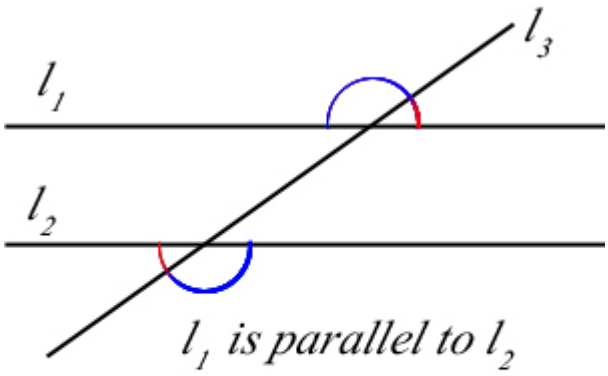
The image above is a simpler version of the image given in the problem. We've labeled the angles A, B, C, and D to make it easier to discuss them.

In order to find the measure of angle A, we need to find the measure of angle B. What is the measure of angle B?

Answers: (Interface Type: TEXT_FIELD)

✔ **35**

Hint 1:



Alternate exterior angles are congruent. Take a look at the image above. The two red angles are alternate exterior angles, and the two blue angles are alternate exterior angles. Take a look at the original question and look for alternate exterior angles.

Hint 2:

Angles B and C are alternate exterior angles.

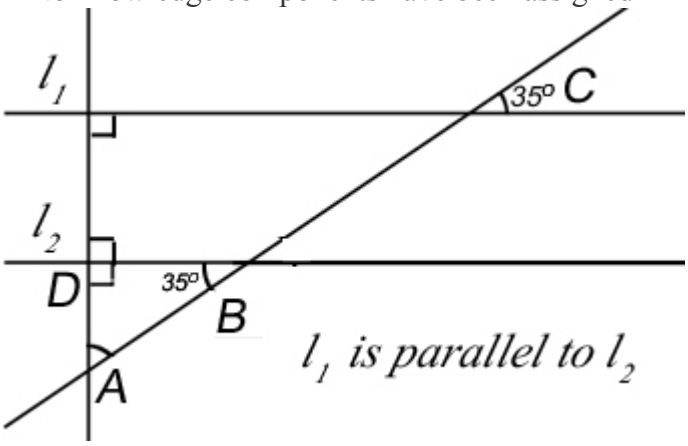
Hint 3:

Since angles B and C are alternate exterior angles, we know that they are congruent. Angle C has a measure of 35 degrees. That means angle B also has a measure of 35 degrees.

Type in 35.

(Problem ID: 14854) TEXT_FIELD [MA - 2001 - Spring - 12]

No knowledge components have been assigned

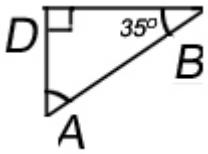


Now that we know that angle B has a measure of 35 degrees, we can solve for the measure of angle A. What is the measure of angle A?

Answers: (Interface Type: TEXT_FIELD)

✔ **55**

Hint 1:



The sum of the interior angles of a triangle is 180.

Hint 2:

The angle B is 35 degrees. The angle D is 90 degrees.

The sum of the measure of angles A, B, and D is 180 degrees.

Set up an equation and solve for A.

Hint 3:

Your equation should look like this:

A + B + D = 180

A + 35 + 90 = 180

Simplify and solve the equation.

Hint 4:

A + 125 = 180

Subtract both sides by 125 to get the value of A.

Hint 5:

A + 125 - 125 = 180 - 125

A = 180 - 125

A = 55

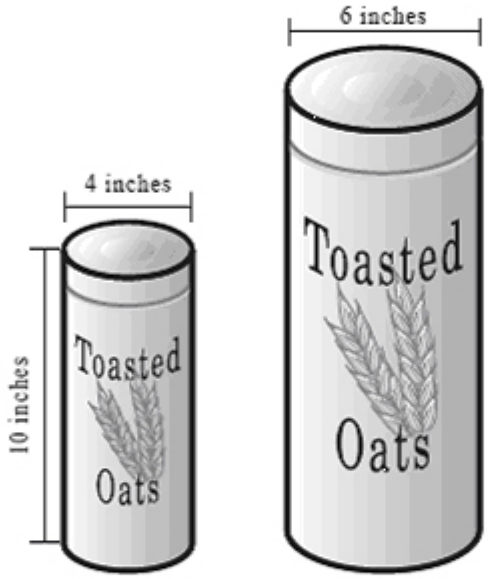
The measure of angle A is 55 degrees.

Type in 55.

18.) "2002.4.10.s" (Problem ID: 13864) RADIO_BUTTON [MA - 2002 - SPRING - 4]

No knowledge components have been assigned

A company packages breakfast cereal in the two sizes of right cylindrical containers shown below. The containers are similar in shape.



How many cubic inches does the large container hold?

A. 90π cubic inches

B. 135π cubic inches

C. 360π cubic inches

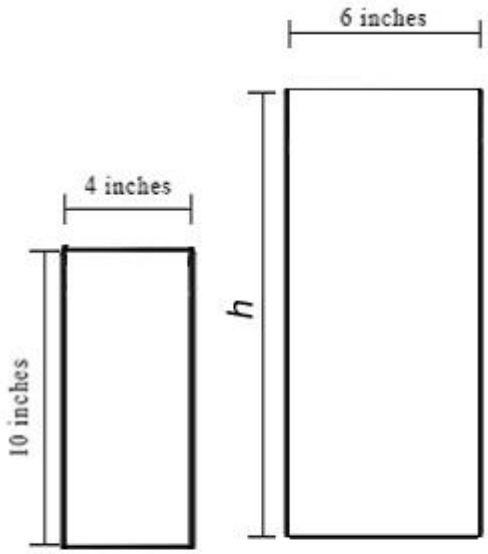
D. 540π cubic inches

Answers: (Interface Type: RADIO_BUTTON)

✔ **A**
✘ B
✘ C
✘ D

(Problem ID: 13865) RADIO_BUTTON [MA - 2002 - SPRING - 4]

No knowledge components have been assigned



A) $\frac{h}{6}=\frac{4}{10}$ C) $\frac{4}{10}=\frac{6}{h}$

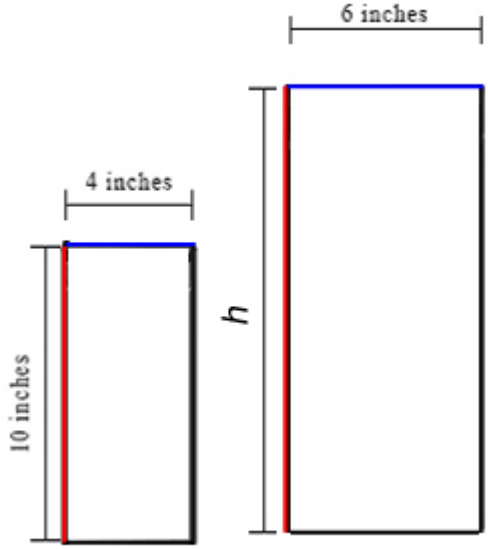
B) $\frac{10}{6}=\frac{h}{4}$ D) $\frac{6}{4}=\frac{10}{h}$

Above is a cleaner version of the problem's picture. To solve for the volume of the larger cylinder, you first need to solve for its height, **h**.
Which of the above equations correctly represents the relationships between the lengths of the sides of the cylinders?

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:



The ratio between the width and height of the smaller cylinder is equal to the ratio of the width and height of the larger cylinder.

Hint 2:

The ratio of the smaller cylinder is 4 / 10. The ratio of the larger cylinder is 6 / h.

Hint 3:

C) $\frac{4}{10} = \frac{6}{h}$

The correct answer is C.

(Problem ID: 14667) TEXT_FIELD [MA - 2002 - SPRING - 4]

No knowledge components have been assigned

C) $\frac{4}{10} = \frac{6}{h}$

Now that you have the equation for the height of the cylinder, solve for h in the equation shown above. What is the height of the cylinder?

Answers: (Interface Type: TEXT_FIELD)

✔ **15**

Hint 1:

Start by multiplying both sides by h.

Hint 2:

$\frac{4*h}{10} = \frac{6*h}{h}$

$\frac{4*h}{10} = \frac{6*\cancel{h}}{\cancel{h}}$

$\frac{4*h}{10} = 6$

false

Hint 3:

$\frac{4*h*10}{10} = 6*10$

$\frac{4*h*\cancel{10}}{\cancel{10}} = 6*10$

$4*h = 6*10$

$4h = 60$

false

Hint 4:

$4h = 60$

$\frac{4h}{4} = \frac{60}{4}$

$\frac{\cancel{4}h}{\cancel{4}} = \frac{60}{4}$

$h = 15$

The height of the cylinder is 15! Type in 15.

(Problem ID: 13866) RADIO_BUTTON [MA - 2002 - SPRING - 4]

No knowledge components have been assigned

Now that you have the height of the larger cylinder, you can find the volume. Find the equation for the volume of a right cylinder on your MCAS reference sheet.

V= π * r?* h

The radius is half of the width. What is the volume of the larger right cylinder?

Answers: (Interface Type: RADIO_BUTTON)

✓ **90π**

✗ 135π

✗ 360π

✗ 540π

Hint 1:

$(6 / 2)^2 * \pi * 15$

Hint 2:

$3^2 * 15 * \pi$

Hint 3:

$9 * 15 * \pi$

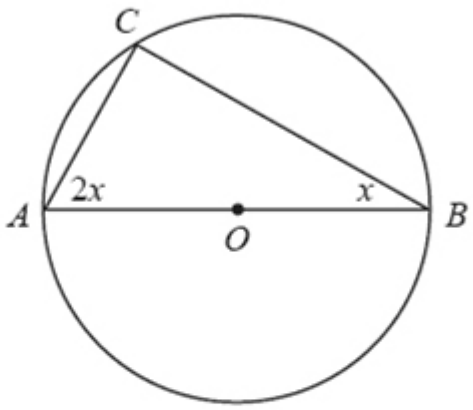
Hint 4:

The answer is 90 π

19.) "2002.re.4.10.s" (Problem ID: 13861) RADIO_BUTTON [MA - 2002 - FALL - 4]

No knowledge components have been assigned

Triangle ABC is inscribed in circle O as shown in the figure below.



What is the measure of $\angle B$?

A. 30°

B. 45°

C. 60°

D. 90°

Answers: (Interface Type: RADIO_BUTTON)

✓ **A**

✗ B

✗ C

✗ D

(Problem ID: 13862) TEXT_FIELD [MA - 2002 - FALL - 4]

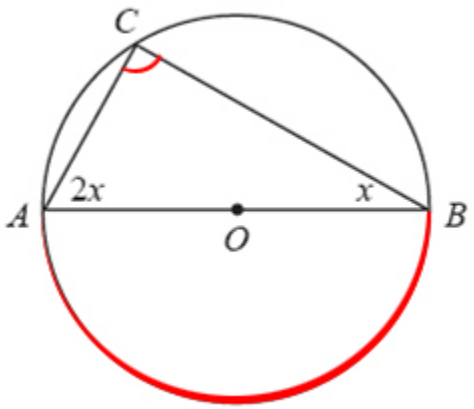
No knowledge components have been assigned

To find the measure of angle B, we need to find x. If we knew the measure of angle C, we could set up an equation for x. What is the measure of angle C?

Answers: (Interface Type: TEXT_FIELD)

✓ **90**

Hint 1:



The inscribed angle law says that an inscribed angle such as angle C has a measure of half of its arc length.

Hint 2:

The arc AB is 180 because AB is a diameter of the circle.

Hint 3:

If the arc length of AB is 180, then the measure of angle C is half of that, 90. Type in 90.

(Problem ID: 15259) TEXT_FIELD [MA - 2002 - FALL - 4]

No knowledge components have been assigned

What is the sum of the angles of a triangle?

Answers: (Interface Type: TEXT_FIELD)

✓ **180**

Hint 1:

The sum of the angles of a triangle is always the same. So, consider a special triangle you know, and find the sum of its angles.

Hint 2:

For example, the sum of the angles of a 30-60-90 triangle is 30 + 60 + 90 = 180.

Hint 3:

The sum of the angles of a 45-45-90 triangle is 45 + 45 + 90 = 180.

Hint 4:

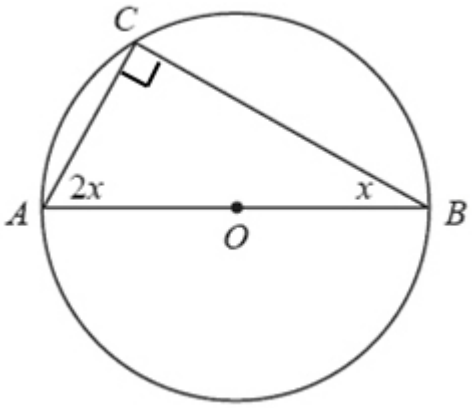
The sum of the angles of a equliateral trangle is 60 + 60 + 60 = 180.

Hint 5:

The sum of the angles of a triangle is 180.

(Problem ID: 13863) TEXT_FIELD [MA - 2002 - FALL - 4]

No knowledge components have been assigned



Now that we have the measure of angle C, and we know the angles add up to 180, what is **x**, the measure of angle B?

Answers: (Interface Type: TEXT_FIELD)

✔ **30**

Hint 1:
Angle A has a measure of 2x. Angle B has a measure of x. Angle C is a right angle and has a measure of 90 degrees.

Since the sum of the angles of a triangle is 180, the sum of the angles A, B, and C is 180.

Using this information, construct an equation and solve for **x**.

Hint 2:
The equation you constructed should look like this:
A + B + C = 180
2x + x + 90 = 180
Solve for x. Subtract 90 from both sides.

Hint 3:
Subtracting 90 from both sides gives you:
2x + x + 90 - 90 = 180 - 90
2x + x = 180 - 90
2x + x = 90
Now combine the like terms and solve for x.

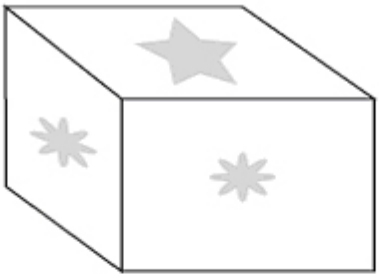
Hint 4:
2x + x = 90
3x = 90
To solve for **x**, divide both sides by 3.

Hint 5:
3x/3 = 90/3
x = 90/3
x = 30
The measure of angle B is x, which is 30! Type in 30.

20.) "2002.re.8.10.b" (Problem ID: 13860) RADIO_BUTTON [MA - 2002 - FALL - 8]

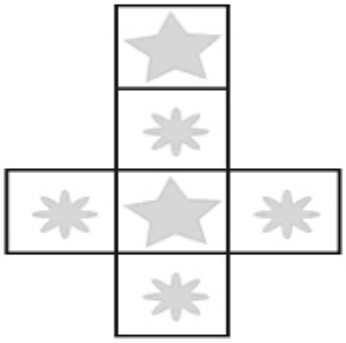
No knowledge components have been assigned

Tammy has a box in the shape of the cube shown below. The cube has a star on the top and the bottom, and a flower on each of the other four faces.

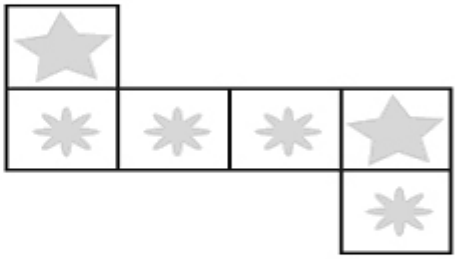


Which of the following patterns could Tammy have used to form the box?

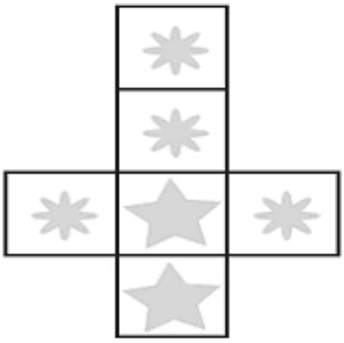
A.



C.



B.



D.

Answers: (Interface Type: RADIO_BUTTON)

✔ **A**

✘ B *Since the stars are adjacent to each other, the stars will not be on the top and bottom of the box when it is folded.*

✘ C *If we fold this box with the star on the right on top, then the flower two squares to the left of it is on the bottom. The other star is not on the bottom.*

✘ D *If we fold this box with the star on the left on top, we find that the flower two squares to the right will be on the bottom. The other star is not on the bottom.*

Hint 1:

Let's concentrate on whether or not the stars are on the top and bottom of the box.

Hint 2:

Choose one of the stars to be the top of the box, then fold it to see if the bottom of the box is also

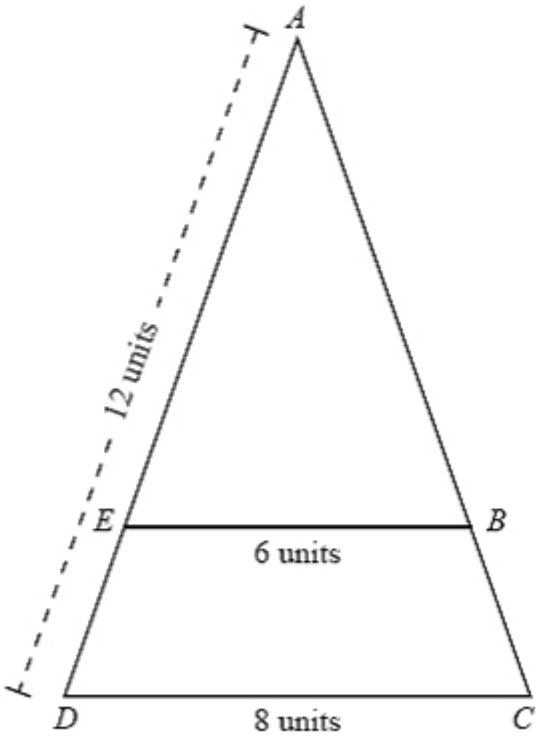
a star.
Hint 3:
If the stars are adjacent to each other like in option B, then when the box is folded, the stars will not be on the top and bottom of the box.
Hint 4:
The correct answer is A. When we fold the box, the stars are on opposite sides of the box.

21.) "2002.re.18.10.s" (Problem ID: 13856) TEXT_FIELD [MA - 2002 - FALL - 18]

No knowledge components have been assigned

Triangle ACD shown below is similar to triangle ABE.

- the measure of $\overline{EB} = 6$ units
- the measure of $\overline{DC} = 8$ units
- the measure of $\overline{AD} = 12$ units



What is the measure of $\overline{AE}$?

Answers: (Interface Type: TEXT_FIELD)
✓ **9**

(Problem ID: 13857) RADIO_BUTTON [MA - 2002 - FALL - 18]

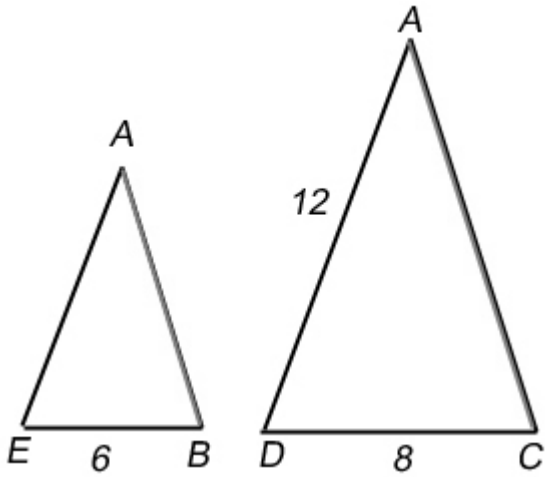
No knowledge components have been assigned

Corresponding sides of similar triangles have the same ratio. Which side corresponds to side AE?

Answers: (Interface Type: RADIO_BUTTON)

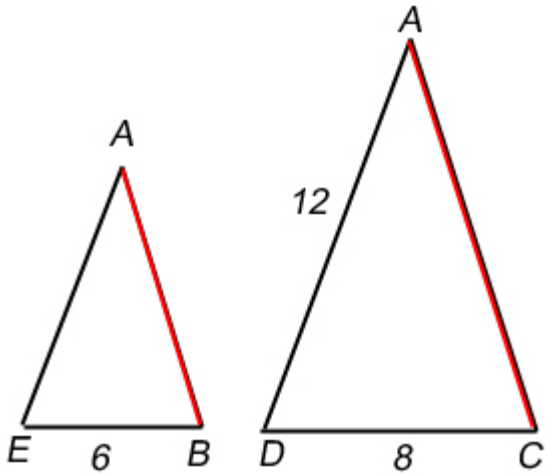
✗ BA
✓ **AD**
✗ AE
✗ DC

Hint 1:



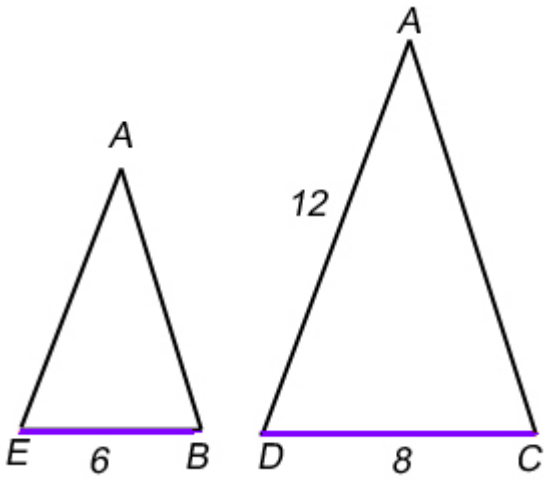
Start by redrawing the picture with the triangles separated. This will make it easier to solve the problem.

Hint 2:

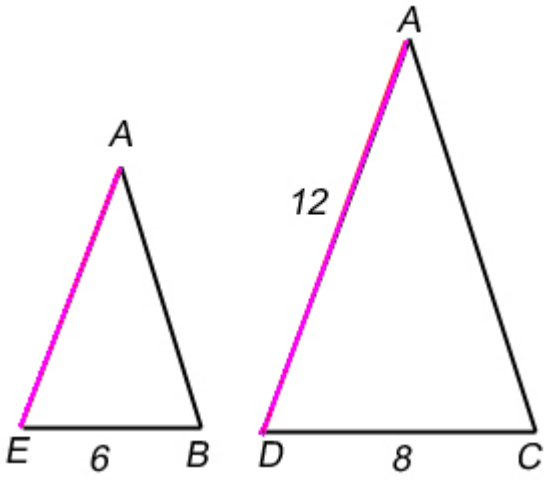


AB and AC are corresponding sides

Hint 3:



EB and DC are corresponding sides
Hint 4:



AE and AD are corresponding sides.
The correct answer is AD. Select AD.

(Problem ID: 13858) RADIO_BUTTON [MA - 2002 - FALL - 18]
No knowledge components have been assigned

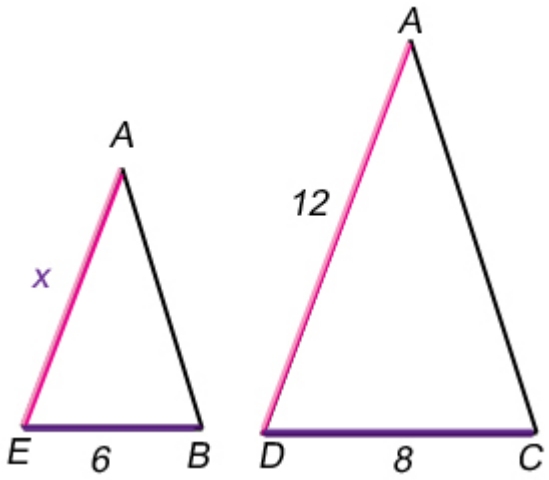
A $\frac{8}{6} = \frac{x}{12}$ B $\frac{6}{8} = \frac{x}{12}$

C $\frac{6}{12} = \frac{x}{8}$ D $\frac{12}{6} = \frac{x}{8}$

Which of the above equations represents the ratios between the corresponding sides?
Answers: (Interface Type: RADIO_BUTTON)
✗ A

✓ **B**
✗ C
✗ D

Hint 1:



The ratio of the small purple side to the large purple side is equal to the ratio of the small pink side to the large pink side.

Hint 2:

$$\frac{6}{8} = \frac{x}{12}$$

The equation that represents the relationship between the pink and purple sides is shown above. Choose answer choice B.

(Problem ID: 13859) TEXT_FIELD [MA - 2002 - FALL - 18]

No knowledge components have been assigned

$$\frac{6}{8} = \frac{x}{12}$$

Using the equation for x shown above, find the value of x. What is the value of x, the length of side AE?

Answers: (Interface Type: TEXT_FIELD)

✓ **9**

Hint 1:

Solve for x by using the properties of equality.

Hint 2:

To simplify and solve for x, start by multiplying both sides by 12.

Hint 3:

$$\frac{6}{8} * \frac{12}{1} = \frac{x}{12} * \frac{12}{1}$$

false

Hint 4:

$$\frac{6*12}{8} = x$$

false

Hint 5:

$$\frac{72}{8} = x$$

false

Hint 6:

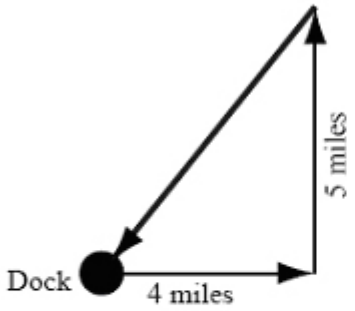
$$x = 9$$

The value of x is 9, that means that the length of side AE is also 9.
Type in 9.

22.) "2002.re.26.10.s" (Problem ID: 13853) RADIO_BUTTON [MA - 2002 - FALL - 26]

No knowledge components have been assigned

A boat traveled 4 miles due east away from a dock. Then it turned and traveled 5 miles due north. Finally, it turned again and traveled back to the dock as shown in the figure below.



Which of the following is closest to the total distance the boat traveled?

A. 12 miles

B. 13 miles

C. 15 miles

D. 18 miles

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

(Problem ID: 13854) RADIO_BUTTON [MA - 2002 - FALL - 26]

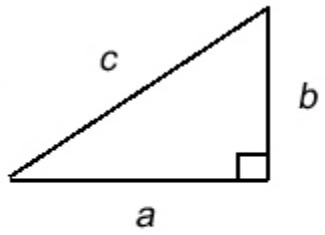
No knowledge components have been assigned

How many miles does the boat travel on the return trip?

Answers: (Interface Type: RADIO_BUTTON)

✗ √21
✗ √36
✓ **√41**
✗ 3

Hint 1:



$a^2 + b^2 = c^2$

Use the Pythagorean Theorem to setup an equation to solve for the distance of the hypotenuse. Refer to your reference sheet to find the Pythagorean Theorem or look at the image above.

Hint 2:

The equation you set up should look like this:

$4^2 + 5^2 = c^2$

Simplify by taking the squares of the constants.

Hint 3:

$16 + 25 = c^2$

$41 = c^2$

Hint 4:

$c = \sqrt{41}$

Choose the answer choice √41.

(Problem ID: 13855) RADIO_BUTTON [MA - 2002 - FALL - 26]

No knowledge components have been assigned

Now that we know the sides of the triangle are 4, 5, and √41, **approximately** how many miles does the boat travel in total?

Answers: (Interface Type: RADIO_BUTTON)

✗ 12
✗ 14
✓ **15**
✗ 18

Hint 1:

What is 4 + 5 + √41?

Hint 2:

9 + √41?

Hint 3:

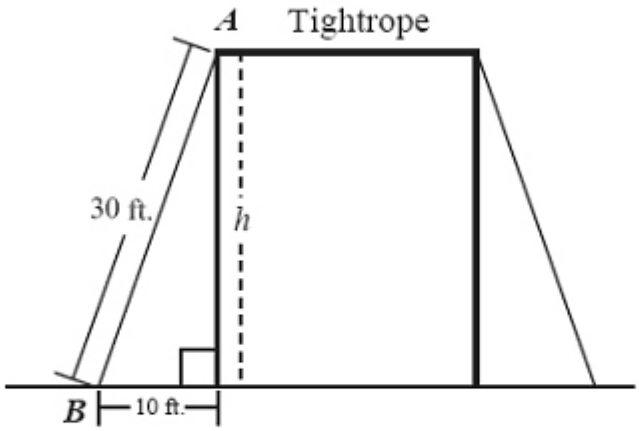
The square root of 41 is somewhere between 6 and 7 because 6 squared is 36, and the square of 7 is 49.

Hint 4:
If you add 9 to something between 6 and 7, you get something near 15. The correct answer is approximately 15 miles. Choose answer choice 15.

23.) "2002.re.40.10.s" (Problem ID: 13851) RADIO_BUTTON [MA - 2002 - FALL - 40]

No knowledge components have been assigned

In order to stabilize a tightrope at a circus, a wire that has a length of 30 feet is attached from the top of the vertical support at point A to point B on the ground. Point B is 10 feet from the base of the vertical support as shown in the figure below.



Based on this information, which of the following is closest to the value of h, the height of the vertical support?

A. 16 feet

B. 20 feet

C. 28 feet

D. 32 feet

Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✓ **C**
✗ D

(Problem ID: 14666) RADIO_BUTTON [MA - 2002 - FALL - 40]

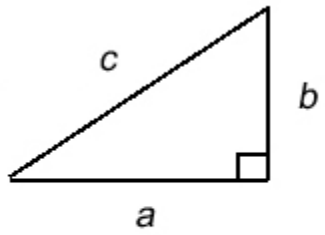
No knowledge components have been assigned

To find the height of the vertical support, we need to find the value of **h**. Using the given information, you can setup an equation to solve for **h**. Which of the following equations can be used to solve for **h**?

Answers: (Interface Type: RADIO_BUTTON)

✗ h + 10 = 30
✗ $h^2 = 30^2 + 10^2$
✗ 30 = 1/2 * 10 * h
✓ **$30^2 = h^2 + 10^2$**

Hint 1:
The wire, ground, and vertical support form a triangle. You can use the Pythagorean Theorem to setup the equation.
Hint 2:



$a^2 + b^2 = c^2$

Pythagorean Theorem can be found on your reference sheet. It is also shown in the image above.
Hint 3:
The Pythagorean Theorem says:
$a^2 + b^2 = c^2$
Replacing the values of **a**, **b**, and **c** with **10, h,** and **30** respectively will give us the equation we need.
Hint 4:
Using the Pythagorean Theorem, we have set up this equation by replacing the values of a and b:
$30^2 = h^2 + 10^2$
Choose the answer choice $30^2 = h^2 + 10^2$.

(Problem ID: 13852) RADIO_BUTTON [MA - 2002 - FALL - 40]

No knowledge components have been assigned
Now that we have the equation $30^2 = h^2 + 10^2$. We need to solve for the value of **h**, which is the height of the vertical support. Which of the following is closest to the value of *h*?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 16 feet
✗ B. 20 feet
✓ **C. 28 feet**
✗ D. 32 feet

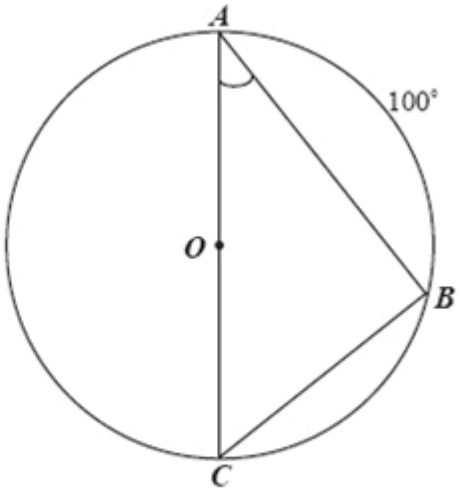
Hint 1:
Start by taking the squares of 10 and 30 inches.
Hint 2:
$30^2 = h^2 + 10^2$
$900 = h^2 + 10^2$
$100 + h^2 = 900$

Hint 3:
Subtracting both sides by 100 gives you:
$100 - 100 + h^2 = 900 - 100$
$h^2 = 900 - 100$
$h^2 = 800$
Now find the answer choice closest to the square root of 800.
Hint 4:
Start by finding the square of each answer choice.
Hint 5:
The squares of the answer choices are:
$16^2 = 256$
$20^2 = 400$
$28^2 = 784$
$32^2 = 1024$
The square of 28 is closest to 800. The correct answer choice is 28 feet. Choose answer choice C.

24.) "2002.19.10.s" (Problem ID: 13846) TEXT_FIELD [MA - 2002 - Spring - 19]

No knowledge components have been assigned

Use the figure below to answer question 19.



Triangle ABC is inscribed in a circle O. What is the measure of $\angle A$?

Answers: (Interface Type: TEXT_FIELD)
✓ **40**

(Problem ID: 13848) TEXT_FIELD [MA - 2002 - Spring - 19]

No knowledge components have been assigned

To find the measure of angle A, we need to find the arc length from B to C. Using the inscribed angle law, which states that the measure of an inscribed angle is half of its arc length, we can find the measure of angle A.
What is the arc length from B to C?

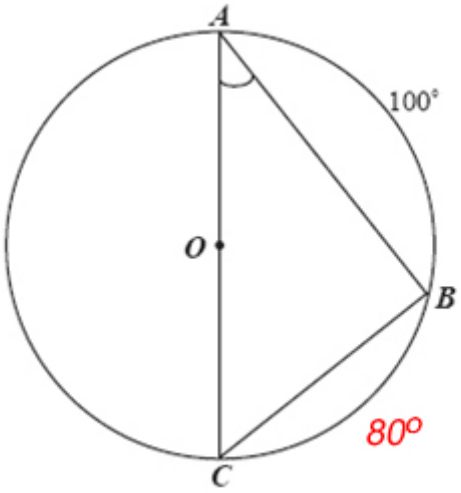
Answers: (Interface Type: TEXT_FIELD)

✓ **80**

Hint 1:
The arc length from A to C is 180 because AC is the diameter of the circle.
Hint 2:
The arc length from A to B is given to be 100. The sum of arc lengths AB and BC is equal to AC. Setup an equation and solve for the arc length of BC.
Hint 3:
AB + BC = AC = 180
AB + BC = 180
100 + BC = 180
Solve for BC by subtracting 100 from both sides.
Hint 4:
100 - 100 + BC = 180 - 100
BC = 180 - 100
BC = 80
The arc length from B to C is 80. Type in 80.

(Problem ID: 13847) TEXT_FIELD [MA - 2002 - Spring - 19]

No knowledge components have been assigned



Now that we know the arc length from B to C is 80, we can find the measure of angle A. What is the measure of angle A?

Answers: (Interface Type: TEXT_FIELD)

✓ **40**

Hint 1:
The inscribed angle law states that the measure of an inscribed angle is half of its arc length.
Hint 2:
The arc length from B to C is 80. The measure of angle A is half of the arc length from B to C.
Hint 3:
The measure of angle A is half of 80 degrees, which is 40 degrees. Type in 40.

25.) "2002.39.10.s" (Problem ID: 13843) RADIO_BUTTON [MA - 2002 - Spring - 39]

No knowledge components have been assigned

Which of the following equations represents a line that is parallel to the line $4x - 2y = 8$ and passes through the point $(0, -8)$?

A. $2x + y = -4$

B. $2x - y = 8$

C. $x - 2y = 8$

D. $x - 2y = 16$

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✓ **B**
✗ C
✗ D

(Problem ID: 13844) TEXT_FIELD [MA - 2002 - Spring - 39]

No knowledge components have been assigned

Since two parallel lines have the same slope, we need to find an equation for a line through (0, -8) that has the same slope as 4x - 2y = 8. Begin by converting the equation into slope-intercept form to find the slope. Slope-intercept form is y= **m**x + b. where **m** is the slope. What is the slope **m**?

Answers: (Interface Type: TEXT_FIELD)

✓ **2**

Hint 1:
Start by separating y in the equation 4x - 2y = 8 by subtracting 4x from both sides.
Hint 2:
Subtracting 4x from both sides gives you:
4x - 4x - 2y = 8 - 4x
-2y =8 - 4x
Simplify further by dividing both sides by -2.
Hint 3:
Dividing both sides by -2 gives you:
-2y/-2 = (8/-2) - (4/-2)x
y = (8/-2) - (4/-2)x
y = -4 - (-2)x
y = -4 + 2x
y = 2x - 4
This gets the equation into the slope-intercept form. You can find the slope by looking at the *coefficient* of x.
Hint 4:
The coefficient of x in the equation y = 2x - 4 is the slope. The slope shown in red is 2. Type in 2.

(Problem ID: 13845) ALGEBRA_FIELD [MA - 2002 - Spring - 39]

No knowledge components have been assigned

The y-intercept is the point at which the line intersects the y-axis. Since we know the line passes through (0, -8), we know that (0, -8) is the y-intercept. Now we can write the equation in slope intercept form (y = mx + b).

Finish the equation y = _____ for our line with slope 2 and y-intercept (0, -8).
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **2x - 8**

Hint 1:
To fill in the slope intercept form y = mx + b, you need the slope and y-intercept. The **m** represents the slope, and the **b** represents the y-intercept.
Hint 2:
Since the slope is 2 and the y-intercept is -8, we can replace m with 2 and b with -8.
Hint 3:
Plugging in the slope and y-intercept gives us the equation y = 2x - 8. Type in 2x - 8.

(Problem ID: 14369) RADIO_BUTTON [MA - 2002 - Spring - 39]

No knowledge components have been assigned
You have found that the equation of the line parallel to 4x - 2y = 8 and passes through the point (0, -8) is:
y = 2x - 8

Now which of the following equations is the same as y = 2x - 8
Answers: (Interface Type: RADIO_BUTTON)
✗ 2x + y = -4
✗ x - 2y = 8
✗ x - 2y = 16
✓ **2x - y = 8**

Hint 1:
You have the equation y = 2x - 8. Add 8 to both sides.
Hint 2:
Adding 8 to both sides gives you:
y + 8 = 2x - 8 + 8
y + 8 = 2x
Now subtract y from both sides.
Hint 3:
Subtracting y from both sides gives you:
y - y + 8 = 2x - y
8 = 2x - y
2x - y = 8
This is one of the answer choices!
Choose 2x - y = 8.

26.) "2002.35.10.s" (Problem ID: 13838) RADIO_BUTTON [MA - 2002 - Spring - 35]

No knowledge components have been assigned

The lengths of three sides of a triangle are 5, 9, and x, all measured in centimeters. What are all possible values of x?

A. $4 < x < 14$

B. $0 < x < 14$

C. $5 < x < 15$

D. $3 < x < 9$

Answers: (Interface Type: RADIO_BUTTON)

✔ **A**

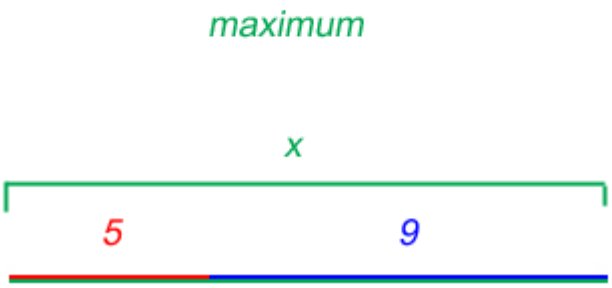
✘ B

✘ C

✘ D

(Problem ID: 13839) TEXT_FIELD [MA - 2002 - Spring - 35]

No knowledge components have been assigned



Take a look at the animation above. Notice how when the red and blue sides are placed end to end, the green line has reached its maximum length. Also, when the red and blue line fold toward one another, the green line becomes shorter until it reaches its minimum length.

The triangle in question has a red side length of 5 and a blue side length of 9. What is the **maximum** length of the green side **x**?

Answers: (Interface Type: TEXT_FIELD)

✔ **14**

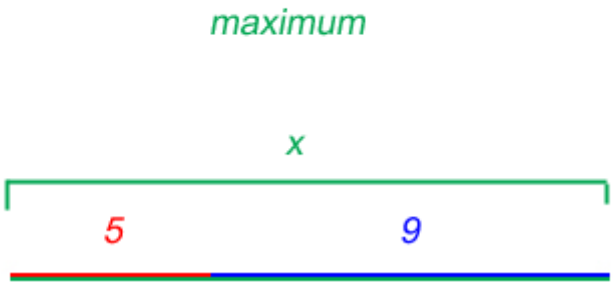
Hint 1:
The green side is at its maximum length when the red and blue sides are placed end to end. The maximum length of **x** is the sum of the red and blue side lengths.

Hint 2:
The red and blue side lengths are 5 and 9 respectively. To find the maximum of x, find the sum of 5 and 9.

Hint 3:
5 + 9 = 14. Type in 14.

(Problem ID: 13840) TEXT_FIELD [MA - 2002 - Spring - 35]

No knowledge components have been assigned



Take a look at the animation above. Notice how when the red and blue sides are placed end to end, the green line has reached its maximum length. Also, when the red and blue line fold toward one another, the green line becomes shorter until it reaches its minimum length.

The triangle in question has a red side length of 5 and a blue side length of 9. What is the **minimum** length of the green side **x**?

Answers: (Interface Type: TEXT_FIELD)

✓ **4**

Hint 1:
The green side is at its minimum length when the red and blue sides are folded over one another. The minimum length of **x** is the difference between the blue and red side lengths.

Hint 2:
The red and blue lengths are 5 and 9 respectively. To find the minimum of x, find the difference of 9 and 5.

Hint 3:
9 - 5 = 4. Type in 4.

(Problem ID: 13841) RADIO_BUTTON [MA - 2002 - Spring - 35]

No knowledge components have been assigned

What is the range of x?

Answers: (Interface Type: RADIO_BUTTON)

✗ 5 < x < 15
✗ 0 < x < 14
✗ 3 < x < 9
✓ **4 < x <14**

Hint 1:
x must be greater than 4 and less than 14.

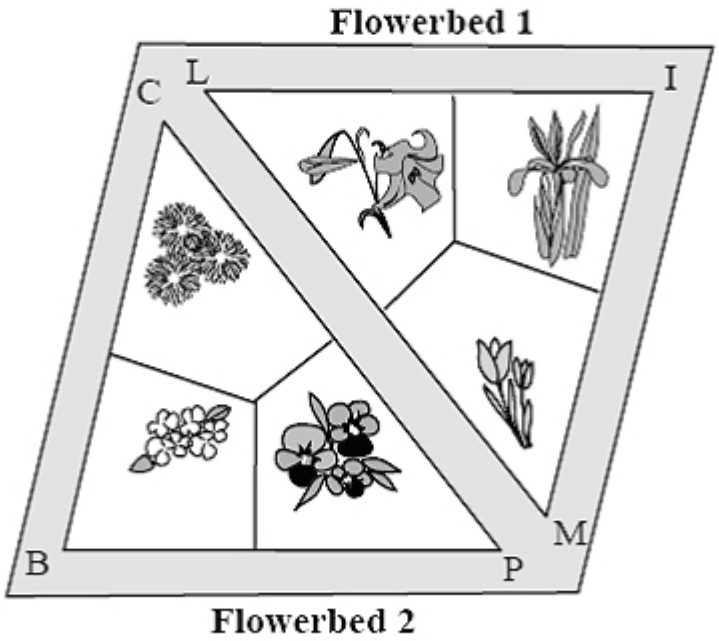
Hint 2:
The inequality that represents the possible values of x is:
4 < x < 14
Choose answer choice 4 < x < 14.

27.) "2002.9.10.s" (Problem ID: 13834) RADIO_BUTTON [MA - 2002 - Spring - 9]

No knowledge components have been assigned

A landscape artist is designing two triangular flowerbeds so that:

- $\triangle LIM \cong \triangle PBC$.
- $\triangle LIM$ encloses Flowerbed 1.
- $\triangle PBC$ encloses Flowerbed 2.
- The measure of $\angle C$ is 50° and the measure of $\angle B$ is 75°.



What is the measure of $\angle L$?

Answers: (Interface Type: RADIO_BUTTON)
✗ 105 degrees
✗ 50 degrees
✓ **55 degrees**
✗ 75 degrees

(Problem ID: 13835) RADIO_BUTTON [MA - 2002 - Spring - 9]

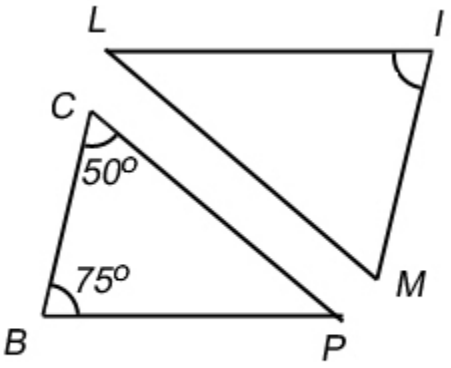
No knowledge components have been assigned

Start by drawing a picture of what you already know.

Triangles LIM and PBC are congruent to each other. In order to find the angle of L, we need to find the angle of the corresponding angle of the congruent triangle. Which of the angles from triangle PBC is congruent to angle L from triangle LIM?

Answers: (Interface Type: RADIO_BUTTON)
✗ B
✗ C
✗ M
✓ **P**

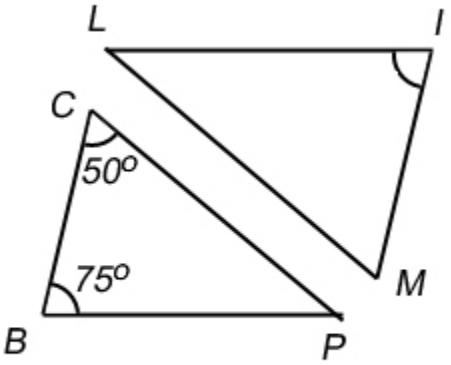
Hint 1:



$\triangle LIM \cong \triangle PBC$

Here is a picture showing what you already know.

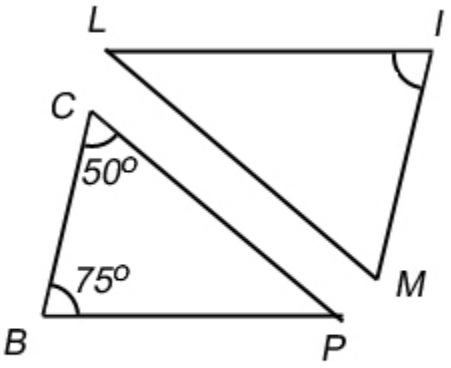
Hint 2:



$\triangle LIM \cong \triangle PBC$

We know that triangle LIM is congruent to PBC. Since I is the second letter of LIM, and B is the second letter of PBC, we know that they are corresponding angles.

Hint 3:



$\triangle LIM \cong \triangle PBC$

Since L is the first letter of LIM, and P is the first letter of PBC, we know that they are corresponding angles. Choose answer choice P.

(Problem ID: 13836) TEXT_FIELD [MA - 2002 - Spring - 9]

No knowledge components have been assigned

If angle L is equal to angle P, then in order to find the measure of angle L, we need to find the angle P. What is the measure of angle of P?

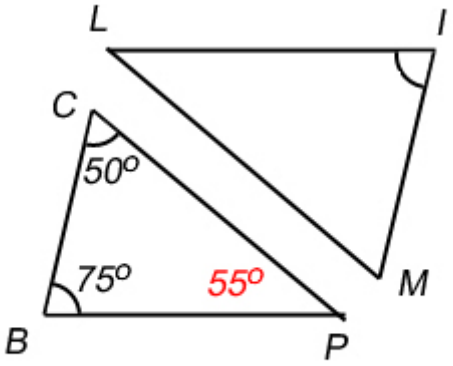
Answers: (Interface Type: TEXT_FIELD)

✓ **55**

Hint 1:
The sum of the angles of a triangle is 180.
Hint 2:
Angle C is 50 degrees, and angle B is 75 degrees.
The sum of angles P, B, and C is 180.
Construct an equation to solve for P based on this information.
Hint 3:
The equation you constructed should look like this:
P + 75 + 50 = 180.
Simplify and solve for P in this equation. Start by combining like terms.
Hint 4:
Combining like terms gives you:
P + 125 = 180
Solve for P by subtracting 125 from both sides.
Hint 5:
P + 125 - 125 = 180 - 125
P = 180 - 125
P = 55
The angle P has a measure of 55! Type in 55.

(Problem ID: 14665) RADIO_BUTTON [MA - 2002 - Spring - 9]

No knowledge components have been assigned



$\triangle LIM \cong \triangle PBC$

Now that we know the measure of angle P is 55 degrees, we can find the measure of angle L. What is the measure of angle L?

Answers: (Interface Type: RADIO_BUTTON)

✗ 50 degrees
✓ **55 degrees**
✗ 75 degrees

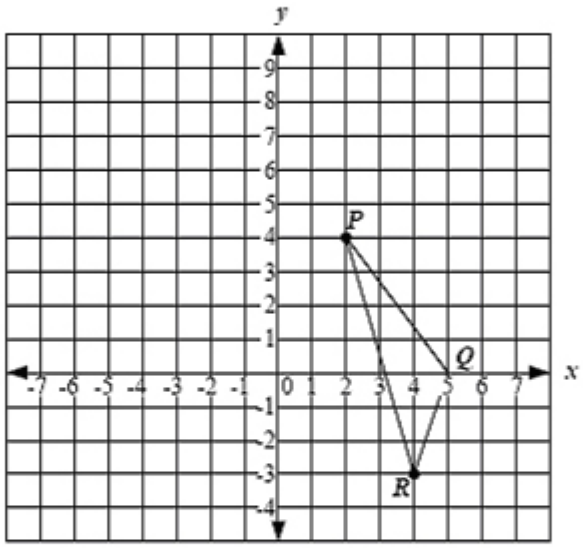
✗ 105 degrees

Hint 1:
Since we found that angle L and angle P are corresponding angles, we know that they are congruent.
Hint 2:
When two angles are congruent, they have the same angle. Since we found that angle P has a measure of 55 degrees, we know that angle L is also 55 degrees.
Choose the answer choice 55 degrees.

28.) "2002.23.10.s" (Problem ID: 13831) RADIO_BUTTON [MA - 2002 - Spring - 23]

No knowledge components have been assigned

Isaac is going to draw ΔSTU on the grid shown below so that it is congruent to ΔPQR.



He located point S at $(-1, 0)$ and point T at $(-4, 4)$. Which of the following coordinates represents a possible location for point U?

A. $(-3, 6)$

B. $(-3, 7)$

C. $(-4, 3)$

D. $(-4, 7)$

Answers: (Interface Type: RADIO_BUTTON)
✗ A
✓ **B**
✗ C
✗ D

(Problem ID: 13832) RADIO_BUTTON [MA - 2002 - Spring - 23]

No knowledge components have been assigned

Begin by drawing a picture! Plot the points that are given. Once you have points S and T plotted, take a look at the length of ST. Which side of PQR is congruent to ST?

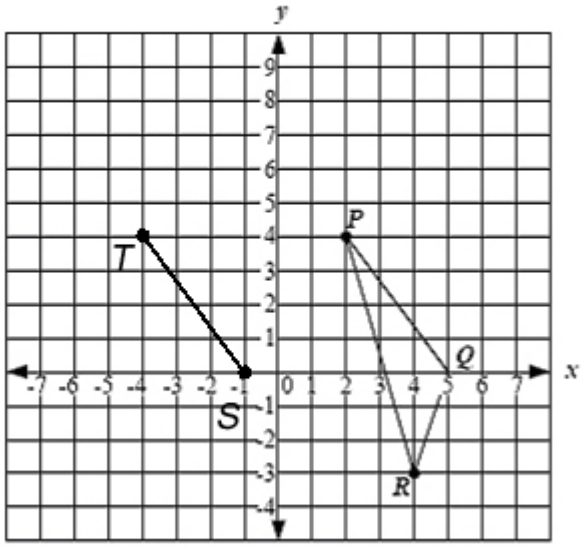
Answers: (Interface Type: RADIO_BUTTON)

✓ **PQ**

✗ PR

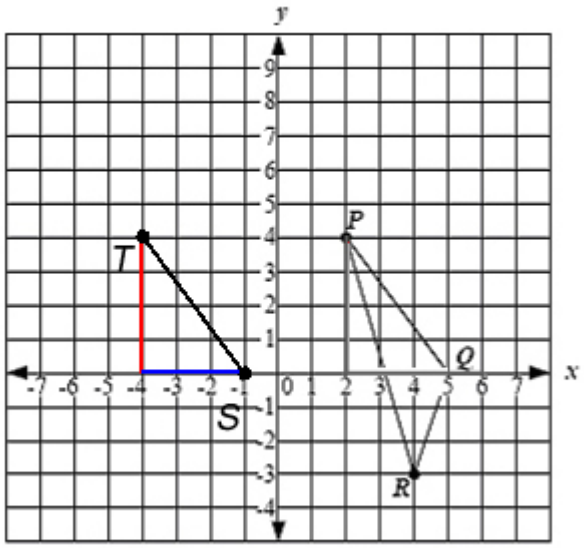
✗ RQ

Hint 1:



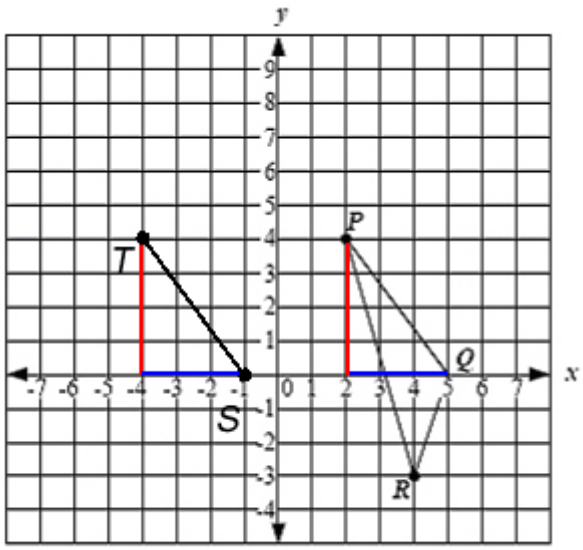
Your drawing of the line ST should look like the one shown above. To find the side of PQR that is congruent to ST, compare the leg lengths of the triangles created by the line segments.

Hint 2:



The above image shows the legs of the triangle created by ST. Find the legs of the triangles created by the sides of triangle PQR and compare them.

Hint 3:



As you can see from the image above, the leg lengths of the triangles created by ST and PQ are congruent. That means that ST and PQ are congruent. Choose answer choice PQ.

(Problem ID: 13833) RADIO_BUTTON [MA - 2002 - Spring - 23]

No knowledge components have been assigned

Try plotting each of the points in the answer choices. Which point creates a triangle with ST that is congruent to PQR?

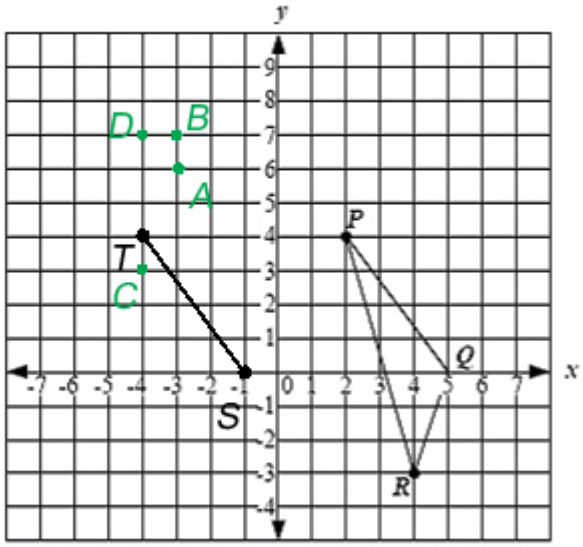
Answers: (Interface Type: RADIO_BUTTON)

✗ A. (-3, 6)
✓ **B. (-3, 7)**
✗ C. (-4, 7)
✗ D. (-4, 3)

Hint 1:

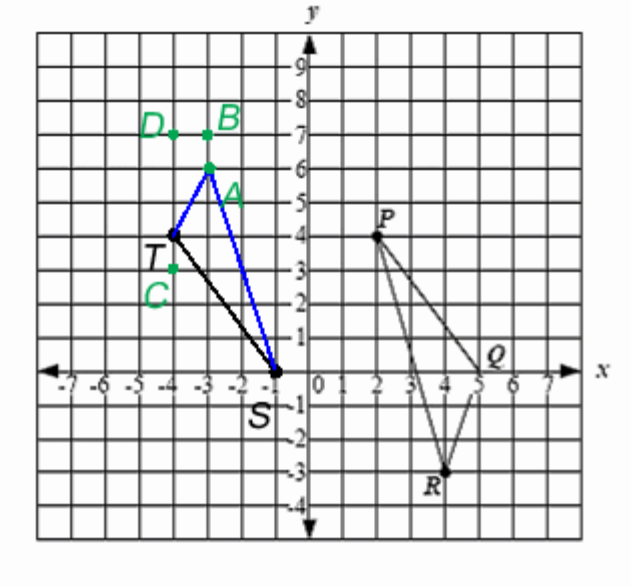
Plot each of the points and check to see which one makes a triangle that is congruent to PQR.

Hint 2:

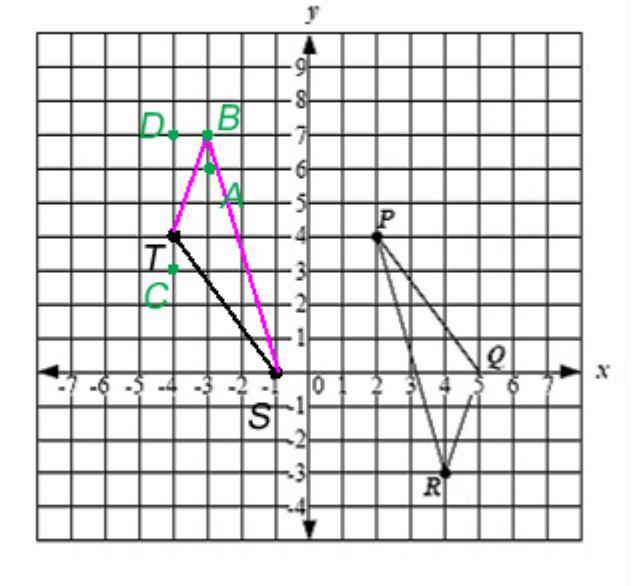


Your picture of the plotted points should look like the one shown above. Draw the triangles

created by each of these points and compare the triangles to PQR.
Hint 3:



The triangles you drew using the given points should look like the ones in the animation above. Find the point that creates a triangle congruent to PQR.
Hint 4:



Point B, (-3, 7), creates a triangle that is congruent to PQR. Choose answer choice B. (-3, 7).

29.) "1998.6.10.geo.s" (Problem ID: 21640) RADIO_BUTTON

No knowledge components have been assigned

A teacher makes the statement, "If all students pass this test, then there will be no homework on Friday." Which of the following would indicate that the teacher did **not** follow through with this statement?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. All of the students passed the test and they did not have homework on Friday.

✗ B. All of the students did not pass the test and they had homework on Friday.

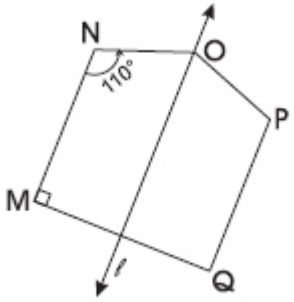
✓ **C. All of the students passed the test and they had homework on Friday.**
✗ D. All of the students did not pass the test and they did not have homework on Friday.

Hint 1:
The teacher's statement only indicates an action **if all of the students pass the test**. If all of the students did not pass the test, then the teacher cannot fail to follow through with his statement.

Therefore you can eliminate B and D because in both of these cases not all the students passed the test and so the teachers can do what ever she wants with the homework.
Hint 2:
The teacher stated that if all the students **pass the test**, there would be **no homework** assigned on Friday. *In A she did just that so this is not a contradiction. So you can eliminate A.*
Hint 3:
In choice C all the students passed the test but there was homework given. The teacher did not follow through so this is a contradiction. The answer is choice C.

30.) "1998.9.10.geo.s" (Problem ID: 21660) RADIO_BUTTON

No knowledge components have been assigned



The line ***l*** is a line of symmetry for figure MNOPQ. What is the measure of angle NOP?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 70 degrees
✗ B. 110 degrees
✓ **C. 140 degrees**
✗ D. 160 degrees

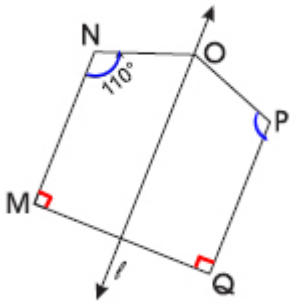
(Problem ID: 21680) RADIO_BUTTON

No knowledge components have been assigned

We know that the line ***l*** is the line of symmetry of MNOPQ. Using this information, we can first find the measures of angles P and Q. Then, using the sum of the interior angles, we can find the measure of angle NOP.

What are the measures of angles P and Q?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. P = 110° and Q = 70°
✓ **B. P = 110° and Q = 90°**
✗ C. P = 70° and Q = 90°
✗ D. P = 90° and Q = 110°

Hint 1:



The image above shows corresponding angles across the line of symmetry of the shape. Angles N and P are corresponding angles. Angles M and Q are also corresponding angles.
Hint 2:
Corresponding angles across the line of symmetry of a shape are congruent. That means, that angle N is congruent to P and angle M is congruent to Q.
Hint 3:
The measure of angle P is equal to that of angle N, which is 110°.
The measure of angle Q is equal to that of angle M, which is 90°
Choose answer choice B.

(Problem ID: 21651) TEXT_FIELD

No knowledge components have been assigned

Since we know the measures of all the angles except O, we can find O by finding the sum of the interior angles of the 5 sided figure (pentagon) MNOPQ and setting up an equation to solve for O.

What is the sum of the interior angles of the 5 sided figure MNOPQ?

Answers: (Interface Type: TEXT_FIELD)

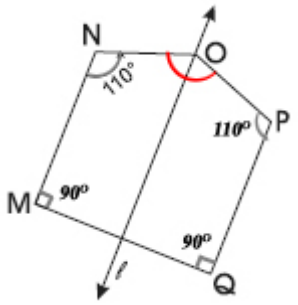
✔ **540**

Hint 1:
The equation for the sum of interior angles is:

Sum of Interior Angles = 180 * (n - 2)
where **n** is the number of sides of the shape.
Hint 2:
Since there are five sides to MNOPQ, **n** = 5.
Sum of Interior Angles of MNOPQ = 180 * (5 - 2)
Hint 3:
180 * (5 - 2) = 180 * 3
540
The correct answer is 540. Type in 540.

(Problem ID: 21652) TEXT_FIELD

No knowledge components have been assigned



Since the sum of all the interior angles of MNOPQ is 540, we can set up the equation M + N + O + P + Q = 540.

Using what you of the measures of angles M, N, P, Q, and the equation above, solve for the measure of angle O.

Answers: (Interface Type: TEXT_FIELD)

✓ **140**

Hint 1:

Plugging in the values of M, N, P, and Q into the equation gives us the following equation:

90 + 110 + O + 110 + 90 = 540

Hint 2:

200 + O + 110 + 90 = 540

200 + O + 200 = 540

O + 400 = 540

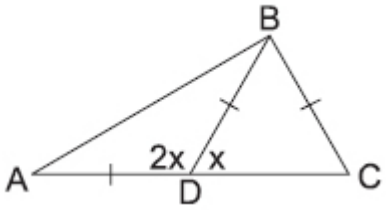
O = 540 - 400

O = 140

The measure of angle O is 140° Type in 140.

31.) "1998.15.10.geo.s" (Problem ID: 21759) RADIO_BUTTON

No knowledge components have been assigned



If AD = BD = BC and the measure of □ADB is twice the measure of □BDC, what is the measure of □ABC?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 70°

✗ B. 80°

✓ **C. 90°**

✗ D. 100°

(Problem ID: 22345) RADIO_BUTTON

No knowledge components have been assigned

In order to find the measure of □ABC we need to know the measure of x. Since no other angles are given we need to look for relationships that will help us write an equation using x. One thing to notice about this figure is that there are two isosceles triangles (triangles with two equal sides and two equal measure angles). But this does not help us because x and 2x are in different triangles. What other relationship do you see between x and 2x?

Answers: (Interface Type: RADIO_BUTTON)

✗ The two angles are complementary so they add to 90

✗ A relationship cannot be determined

✗ The two angles are equal

✓ **The two angles are supplementary so they add to 180**

Hint 1:

Notice that □ADB and □BDC together form a straight angle.

Hint 2:

A straight angle has a measure of 180°

Hint 3:

If two angles together form a straight angle, their measures add up to 180, they are supplementary angles.

(Problem ID: 21820) TEXT_FIELD

No knowledge components have been assigned

In order to find the measure of □ABC, you should first find the measure of the angles □ABD and □DBC using what you know about isosceles triangles. In order to do that, you must first find the value of **x**.

We know that □ADB and □BDC are supplementary angles. What is the value of **x**?

Answers: (Interface Type: TEXT_FIELD)

✓ **60**

Hint 1:

Since angles □ADB and □BDC are supplementary, the sum of their measures, *2x and x*, is 180°.

Hint 2:

You need to solve for x in the equation:

2x + x = 180

Hint 3:

2x + x = 180

3x = 180

3x / 3 = 180 / 3

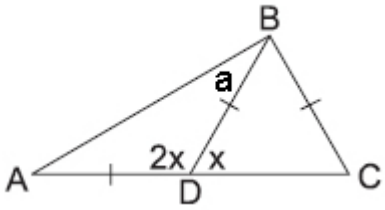
x = 180 / 3

x = 60

The value of x is 60. Type in 60.

(Problem ID: 21821) TEXT_FIELD

No knowledge components have been assigned



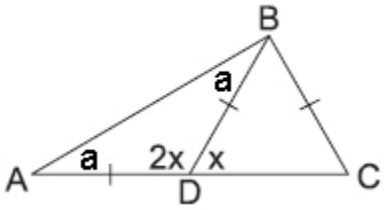
Since segment AD = BD, the triangle ADB is an isosceles triangle. Using the properties of an isosceles, you can set up an equation to solve for the measure of □ABD labeled as **a**.

What is the value of a?

Answers: (Interface Type: TEXT_FIELD)

✓ **30**

Hint 1:



Since triangle ADB is an isosceles triangle, we know that □ABD is congruent to □BAD. That means they have the same measure.

Hint 2:

Using the fact that the sum of the angles of a triangle is 180, we can set up this equation to solve for a:

a + a + 2x = 180

Hint 3:

We know that the value of x is 60. So ...

a + a + 2 * 60 = 180

Hint 4:

2a + 120 = 180

2a = 180 - 120

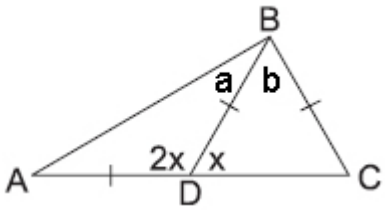
2a = 60

a = 30

The value of a is 30! Type in 30.

(Problem ID: 21822) TEXT_FIELD

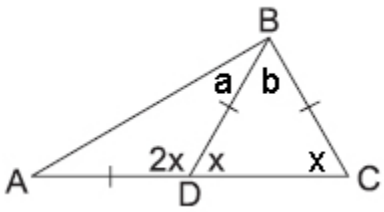
No knowledge components have been assigned



Since segment BD = BC, the triangle BDC is an isosceles triangle. Using the properties of an isosceles, you can set up an equation to solve for the measure of □DBC labeled as **b**.

What is the value of b?
Answers: (Interface Type: TEXT_FIELD)
✓ **60**

Hint 1:

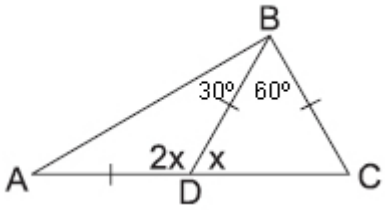


Since triangle BDC is an isosceles triangle, we know that □BDC is congruent to □BCD. That means they have the same measure.
Hint 2:
Using the fact that the sum of the angles of a triangle is 180, we can set up this equation to solve for b:

b + 2x = 180
Hint 3:
b + 2 * 60 = 180
b + 120 = 180
b = 60
The value of b is 60! Type in 60.

(Problem ID: 21823) TEXT_FIELD

No knowledge components have been assigned



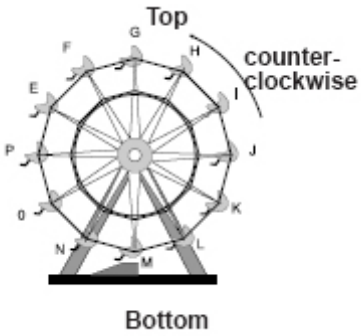
Now that we have the value of **a** and **b**, we can find the measure of □ABC.

What is the measure of □ABC?
Answers: (Interface Type: TEXT_FIELD)
✓ **90**

Hint 1:
Since □ABC is the combination of □ABD and □DBC, its measure is the sum of the measure of □ABD and □DBC.
Hint 2:
30 + 60 = 90
The measure of □ABC is 90 degrees.
Type in 90.

32.) "1998.21.10.geo.s" (Problem ID: 21787) RADIO_BUTTON

No knowledge components have been assigned



The spokes of on the Ferris wheel are evenly spaced. After 2 1/4 complete turns how many degrees will car M have traveled?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 90°
✗ B. 225°
✗ C. 450°
✓ **D. 810°**

(Problem ID: 21788) TEXT_FIELD

No knowledge components have been assigned

Let's start by figuring out how many degrees car M will have turned after **one** complete turn.

Answers: (Interface Type: TEXT_FIELD)

✓ **360**

Hint 1:
A complete turn on Ferris Wheel would mean traveling one time around a circle.
Hint 2:
There are 360 degrees in a circle!
Type in 360.

(Problem ID: 22441) TEXT_FIELD

No knowledge components have been assigned

Now let's figure out how many degrees car M will have turned after a **quarter** turn.

Answers: (Interface Type: TEXT_FIELD)

✓ **90**

Hint 1:
If there are 360 degrees in a complete turn. Then there is a quarter of that many degrees in a quarter turn.
Hint 2:
To find a quarter of 360, you divide 360 by 4.
360 / 4 = 90.
There are 90 degrees in a quarter turn.
Type in 90

(Problem ID: 21790) TEXT_FIELD

No knowledge components have been assigned

Now that you know how many degrees are traveled in a complete turn, you can find how many degrees are in 2 1/4 complete turns.

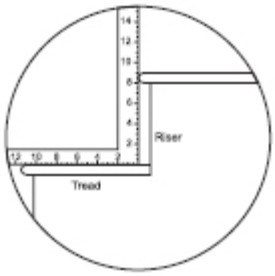
Answers: (Interface Type: TEXT_FIELD)

✓ **810**

Hint 1:
If there are 360 degrees in a complete turn and 90 degrees in a quarter turn, you can find the number of degrees in two complete turns and a quarter turn by finding 360 + 360 + 90.
Hint 2:
360 + 360 + 90 =
720 + 90 = **810**
The car travels 810° in 2 1/4 complete turns.
Type in 810.

33.) "1998.24.10.geo.s" (Problem ID: 21791) RADIO_BUTTON

No knowledge components have been assigned



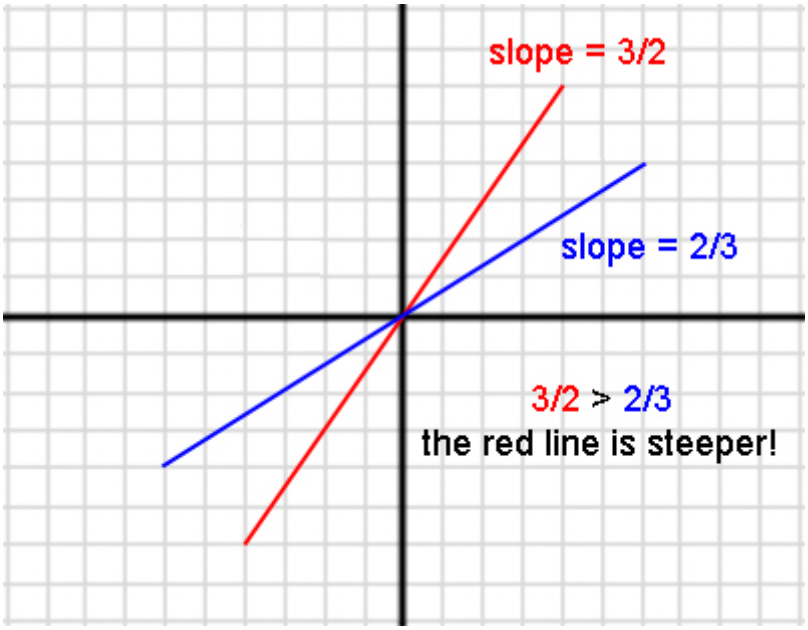
The diagram shows a carpenter's square that is used to measure riser height and tread length. A carpenter has been asked to replace a staircase with one that is less steep. The carpenter could
Answers: (Interface Type: RADIO_BUTTON)
✗ A. increase the rise height leaving the tread length the same.
✓ **B. increase the tread length leaving the riser height the same.**
✗ C. increase the tread length and the riser height proportionally.
✗ D. decrease the tread length and the riser height proportionally.

(Problem ID: 21792) RADIO_BUTTON

No knowledge components have been assigned

Which of the following would cause the staircase to be less steep?
Answers: (Interface Type: RADIO_BUTTON)
✗ increase the slope of the staircase
✓ **decrease the slope of the staircase**

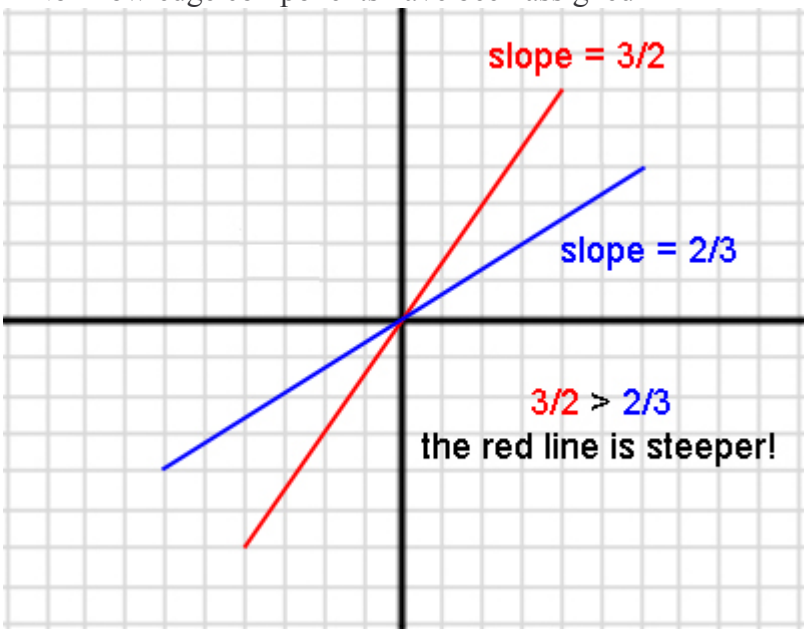
Hint 1:
The slope is the rise over the run. In the case of a staircase, it is the height over the length.
Hint 2:



Decreasing the slope makes the staircase less steep.

(Problem ID: 21793) RADIO_BUTTON

No knowledge components have been assigned



In order to make the staircase less steep, the carpenter needs to decrease the slope of the staircase. The slope is defined as the *height / length*. Which of the following options will make the staircase less steep?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. increase the rise height leaving the tread length the same.
✓ **B. increase the tread length leaving the riser height the same.**
✗ C. increase the tread length and the riser height proportionally.
✗ D. decrease the tread length and the riser height proportionally.

Hint 1:

In order to decrease the slope, you need to decrease the height relative to the length.

Hint 2:

Answer choice B increases the length, which decreases the height relative to the length.
Choose answer choice B.

34.) "1998.27.10.geo.s" (Problem ID: 21794) RADIO_BUTTON

No knowledge components have been assigned

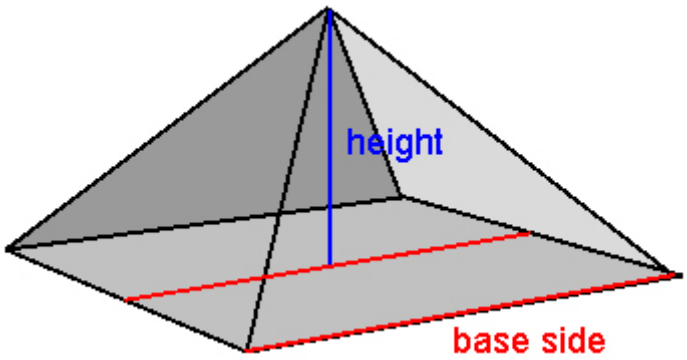
The ratio of the volume of a **square pyramid** with the dimension of the base y units on a side and 3y units high, compared to the volume of a **square prism** y units on a side and y/3 units high _____.

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. is greater than one.**
✗ B. is equal to one.
✗ C. is less than one.
✗ D. cannot be determined.

(Problem ID: 21795) RADIO_BUTTON

No knowledge components have been assigned



To find the ratio, we first need to find the volumes of each object.
First let's find the volume of a **square pyramid** with the dimension of the base **y** units on a side and **3y** units high.
What expression below represents the volume of the square **pyramid**?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 1/3 * y² * 3y**
✗ B. 1/3 * 3y * y
✗ C. (3y)² * 3y
✗ D. y * 3y

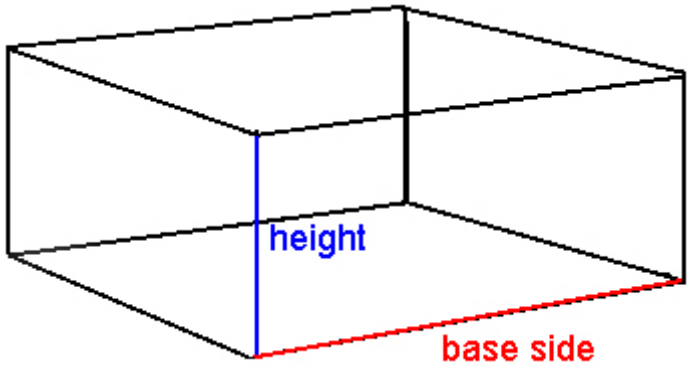
Hint 1:

$$V = \frac{1}{3}s^2h$$

The volume of a square pyramid is shown above where the dimension of the base is **s** units and **h** units high.

You can also find this formula on your reference sheet.
Hint 2:
Substitute the variable **s** with y and the variable **h** with 3y.
Hint 3:
The correct answer is 1/3 * y^2 * 3y.
Choose answer choice A.

(Problem ID: 21824) RADIO_BUTTON
No knowledge components have been assigned



Now let's find the volume of a **square prism** with the dimension of the base **y** units on a side and **y/3** units high.
What expression below represents the volume of the square **prism**?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 1/3 * y^2 * y/3
✗ B. y^2 * 3y
✗ C. $(y/3)^2$ * y
✓ **D. y^2 * y/3**
Hint 1:

$$V = s^2 h$$

The volume of a square prism is shown above where the dimension of the base is **s** units and **h** units high.

You can also find this formula on your reference sheet. The formula on your reference sheet is for *rectangular* prisms. Since we have a *square* prism, we can substitute the value for the length and width of the prism for the same value **s**
Hint 2:
Substitute the variable **s** with y and the variable **h** with y/3.
Hint 3:
The correct answer is y^2 * y/3.
Choose answer choice D.

(Problem ID: 21796) RADIO_BUTTON

No knowledge components have been assigned

Now that you have found the volume of the square pyramid and the square prism, which of the following is true about the ratio of the volume of the square pyramid to the volume of the square prism?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. is greater than one.**

✗ B. is equal to one.

✗ C. is less than one.

✗ D. cannot be determined.

Hint 1:

A ratio can be written as a fraction and then simplified. For example, in a classroom with 15 boys and 5 girls, the ratio of boys to girls is 15/5 or 3. In our problem we want to set up a fraction between the volume of the pyramid and the volume of the prism and simplify it.

Hint 2:

We can simplify the expressions we have for the volumes in this way:

square pyramid : $1/3 * y^2 * 3y = y^3$

square prism : $y^2 * y/3 = y^3/3$

Hint 3:

$$\frac{y^3}{\frac{y^3}{3}} =$$

$$\frac{y^3 * 3}{\frac{y^3 * 3}{3}} =$$

$$\frac{y^3 * 3}{y^3} =$$

$$\frac{y^3 * 3}{y^3} = 3$$

Hint 4:

3 is greater than one. We also know that y^3 is greater than $y^3/3$, so the ratio **must** be greater than one. Choose answer choice A.

35.) "1998.20.10.geo.s" (Problem ID: 21797) RADIO_BUTTON

No knowledge components have been assigned

The lengths of three sides of a triangle are in the ratio of 3:4:5 and the perimeter of the triangle is 48 inches. the length of the **longest** side of the triangle is

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 15 inches.

✓ **B. 20 inches.**

✗ C. 25 inches.

✗ D. 28 inches.

(Problem ID: 22903) RADIO_BUTTON

No knowledge components have been assigned

Triangle	Side Lengths	Perimeter
A	3, 4, 5	
B	6, 8, 10	
C	8, 10, 12	
D	12, 16, 20	

In the chart above, there are four triangles: **A, B, C, and D**. The lengths of the sides of each triangle are shown in the Side Length column. Which of the triangles does not have sides with a ratio of 3:4:5?

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✓ **B**
✗ C
✗ D

Hint 1:
Obviously triangle A has sides with the ratio of 3:4:5. If you double the length of each side of triangle A, you get triangle B. This preserves the ratio 3:4:5 of the sides.

Hint 2:
Now lets look at D, Since 3 * 4 = 12 and 4 * 4 = 16 and 5 * 4 = 20 then the measurements in D preserve the ratio 3:4:5

Hint 3:
This leaves us with C. Since 8:10:12 reduces to 4:5:6 it is not equivalent to 3:4:5.

Therefore C does not have a ratio of 3:4:5. Choose answer choice C.

(Problem ID: 22904) RADIO_BUTTON

No knowledge components have been assigned

Triangle	Side Lengths	Perimeter
A	3, 4, 5	12
B	6, 8, 10	
~~C~~	~~8, 10, 12~~	
D	12, 16, 20	

Now that we have eliminated one of the choices. Lets find the perimeters of the remaining triangles. The perimeter of triangle A is given to you.

Which triangle whose sides have a ratio of 3:4:5 has a perimeter of 48?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✗ C
✓ **D**

Hint 1:
Let's start by finding the perimeter of triangle B. The lengths of the sides of triangle B are: 6, 8 and 10. To find the perimeter, you take the sum of the side lengths: 6 + 8 + 10.
Hint 2:
The perimeter of triangle B is 6 + 8 + 10 = 24. Now find the perimeter of triangle D whose side lengths are 12, 16, and 20.
Hint 3:
The perimeter of triangle D is 12 + 16 + 20 = 48.
Choose answer choice D.

(Problem ID: 22905) TEXT_FIELD
No knowledge components have been assigned

Triangle	Side Lengths	Perimeter
A	3, 4, 5	12
B	6, 8, 10	24
~~C~~	~~8, 10, 12~~	
D	12, 16, 20	48

We have found that triangle D has a perimeter of 48 and has side with a ratio of 3:4:5.

What is the length of the longest side?
Answers: (Interface Type: TEXT_FIELD)
✓ **20**

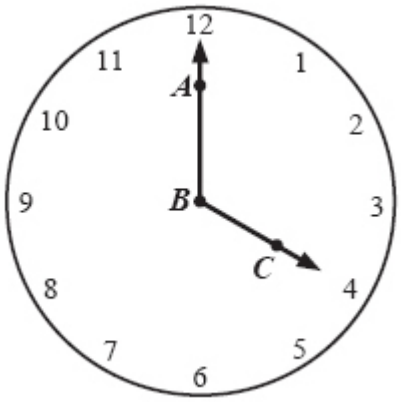
Hint 1:

Triangle	Side Lengths	Perimeter
A	3, 4, 5	12
B	6, 8, 10	24
~~C~~	~~8, 10, 12~~	
D	12, 16, 20	48

The longest side of the triangle D shown in the chart above is circled.
Hint 2:
The correct answer is 20. Type in 20.

36.) "2001.re.10.1.geo.s" (Problem ID: 22900) RADIO_BUTTON

No knowledge components have been assigned

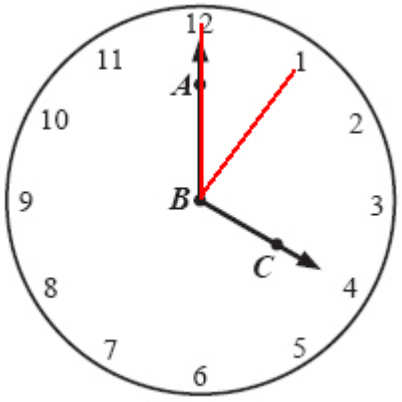


The figure above shows angle ABC formed by the hands of the clock at 4 o'clock.

What is the measure of angle ABC?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 60°
✗ B. 90°
✓ **C. 120°**
✗ D. 150°

(Problem ID: 22901) TEXT_FIELD

No knowledge components have been assigned



In order to find the measure of ABC, we must first find the measure of one hour on the clock. The image above shows the angle representing one hour on the clock in red. The clock is divided into 12 pieces by each of the hours on the clock.

How many degrees does each hour on the clock represent?
Answers: (Interface Type: TEXT_FIELD)
✓ **30**

Hint 1:
There are 360 degrees in a circle. That means the sum of the measures of 12 hours is 360 degrees.
Hint 2:
The measure of one hour is 360 degrees divided amongst the 12 hours. So solve the expression:
360 / 12
Hint 3:
360 / 12 = 30

The correct answer is 30. Type in 30.

(Problem ID: 22902) TEXT_FIELD

No knowledge components have been assigned

Now that we know each hour on the clock has a measure of 30 degrees, we can find the measure of angle ABC.
What is the measure of angle ABC?
Answers: (Interface Type: TEXT_FIELD)
✓ **120**

Hint 1:
There are four hours between the 12 and the 4 on the clock.
Hint 2:
The measure of the angle from 12 to 4 o'clock is the sum of the measures of the 4 hours between them. That means that for each of the 4 hours between 12 and 4, there are 30 degrees.
Hint 3:
30 + 30 + 30 + 30 = 120
The measure of the angle ABC is 120 degrees. Type in 120.

End Random Order Section
End Linear Section

Module Name: 10thGradeRT-ALLScaff

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Random Order Section

1.) "2003_5_10(2006/09/14 10:50:37)" (Problem ID: 12916) RADIO_BUTTON [MA - 2003 - SPRING - 5]

No knowledge components have been assigned

What is the simplified form of the expression √(450)

Answers: (Interface Type: RADIO_BUTTON)

A. 15√2
B. 45√2
C. 75√2
D. 225√2

(Problem ID: 12919) TEXT_FIELD [MA - 2003 - SPRING - 5]

No knowledge components have been assigned

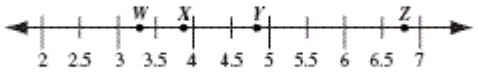
What is the largest perfect square that can be factored out of 450?

Answers

2.) "2003_8_10(2006/09/14 11:48:29)" (Problem ID: 12921) RADIO_BUTTON [MA - 2003 - SPRING - 8]

No knowledge components have been assigned

Which point most closely indicates the location of $\sqrt[3]{60}$ on the number line below?



Answers: (Interface Type: RADIO_BUTTON)

✗ A. W
✓ **B. X**
✗ C. Y
✗ D. Z

(Problem ID: 12923) TEXT_FIELD [MA - 2003 - SPRING - 8]

No knowledge components have been assigned

Since we are looking for a whole number that when cubed gets close to 60 what is the closest perfect cube to 60?

Answers: (Interface Type: TEXT_FIELD)

✓ **64**

Hint 1:
Start by cubing all the whole numbers on the number line.
Hint 2:
Cube 3,4,5, and 7 since they are the closest to the points.
Hint 3:
We find that 4 cubed is 64, which is closest to 60. Enter 64.

(Problem ID: 12924) RADIO_BUTTON [MA - 2003 - SPRING - 8]

No knowledge components have been assigned

Now what point is close to 4 on the number line.

Answers: (Interface Type: RADIO_BUTTON)

✗ C. Y
✓ **B. X**
✗ D. Z
✗ A. W

Hint 1:
Remember, 60 is slightly below 64, so our point should be slightly below 4.
Hint 2:
X is slightly below 4 on the number line.
Hint 3:
Choose B, because X is slightly below 4 on the number line.

3.) "2005_1_10(2006/09/20 11:00:26)" (Problem ID: 13049) RADIO_BUTTON [MA - 2005 - Spring - 1]

No knowledge components have been assigned

What is the value of the expression below?

$(3^2+3)(3^2-3)$

Answers: (Interface Type: RADIO_BUTTON)
✔ **72**
✘ 90
✘ 81
✘ 27

(Problem ID: 13050) TEXT_FIELD [MA - 2005 - Spring - 1]

No knowledge components have been assigned

This is an order of operation problem; remember to properly follow the order of operations when simplifying this expression. What does the expression within the first parenthesis reduce to?

Answers: (Interface Type: TEXT_FIELD)
✔ **12**

Hint 1:
The order of operations is parentheses, then exponents, then, from left to right, multiplication/division, and finally, from left to right addition/subtraction.

Hint 2:
Remember, follow the order of operations within the parenthesis as well. First lets square the three. $(3^2+3)(3^2-3)$

Hint 3:

Now we have this

$(9+3)(3^2-3)$

Combine the 9 and 3.

Hint 4:

The answer inside the left parenthesis would be 12 when you add 9 + 3, and our process would look like this

$(3^2+3)(3^2-3)$

$(9+3)(3^2-3)$

$(12)(3^2-3)$

Enter 12, the value in the left parenthesis

(Problem ID: 13051) TEXT_FIELD [MA - 2005 - Spring - 1]

No knowledge components have been assigned

We now have $12(3^2-3)$. What is the value in the second parenthesis?

Answers: (Interface Type: TEXT_FIELD)

✓ **6**

Hint 1:
Remember, follow the order of operations within this parenthesis as well.
Hint 2:
Our first step is to square the 3.

$12(3^2-3)$

$12(9-3)$

Hint 3:
The answer inside the left parenthesis would be 6.

$12(3^2-3)$

$12(9-3)$

$12(6)$

Enter 6, which is the reduced value in the right parenthesis.

(Problem ID: 13052) RADIO_BUTTON [MA - 2005 - Spring - 1]

No knowledge components have been assigned

Our expression now looks like this (12)(6). Find the final product of the two sets of parenthesis. What is our final value?

Answers: (Interface Type: RADIO_BUTTON)

✓ **72**
✗ 90
✗ 27
✗ 81

Hint 1:
Multiply the values within the two sets of parenthesis together
Hint 2:
Multiply the 12 from the first parenthesis, by the 6 in the second one.
Hint 3:
12*6 is 72, choose 72.

4.) "2005_6_10 (2006/09/20 12:48:14)" (Problem ID: 13072) RADIO_BUTTON [MA - 2005 - Spring - 6]

No knowledge components have been assigned

The Golden Ratio is defined by the expression shown below.

$(1+\sqrt{5})/2$

Which of the following is closest to the value of the ratio?

Answers: (Interface Type: RADIO_BUTTON)

✓ **1.6**

✗ 1.2
✗ 2.9
✗ 2.1

(Problem ID: 13073) ALGEBRA_FIELD [MA - 2005 - Spring - 6]

No knowledge components have been assigned

This is an order of operation problem; remember to properly follow the order of operations when simplifying this expression. Also, in order to evaluate this we will have to estimate, unless you know the √5 already. What number, whose square root we know, is very close to 5?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **4**

Hint 1:

If you can't think of a number near 5 that can be easily square rooted(is a perfect square) try squaring some simple numbers below 5, like 2 and 3.

Hint 2:

5 is very close to 4 whose square root is 2

Hint 3:

4 would be a good number to use because it is close to 5 and we know its square root, enter 4

(Problem ID: 13074) ALGEBRA_FIELD [MA - 2005 - Spring - 6]

No knowledge components have been assigned

We know that 5 is a little more than 4 (whose square root is 2) therefore the our estimate using 2 will be smaller than the real value. Now, continue to evaluate the expression, using 2 instead of √5. What fraction do you end up with?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **3/2**

Hint 1:

The expression now looks like (1+2)/2

Add the 1 and 2 within the parenthesis to get 3.

Hint 2:

Our procedure looks like this

(1+2)/2

3/2

Hint 3:

The fraction would be 3/2 enter 3/2

(Problem ID: 13075) RADIO_BUTTON [MA - 2005 - Spring - 6]

No knowledge components have been assigned

Dividing 3 by 2 gives us 1.5. But we know our answer is a little bit bigger than that. So now, from the original answers, what is the evaluated expression?

Answers: (Interface Type: RADIO_BUTTON)

✓ **1.6**
✗ 1.2
✗ 2.9
✗ 2.1

Hint 1:
Which of the answers is slightly bigger than 1.5?
Hint 2:
1.6 is slightly bigger than 1.5, choose 1.6.

5.) "2005_7_10 (2006/09/20 13:52:11)" (Problem ID: 13076) RADIO_BUTTON [MA - 2005 - Spring - 7]

No knowledge components have been assigned
In which equation below is the solution equal to the multiplicative inverse of 2/3?
Answers: (Interface Type: RADIO_BUTTON)
✗ 2/3*r=0 *2/3*r=0 can't be correct because a multiplicative inverse is the number that multiplied by a number makes it 1, this r turned it into 0. The number that multiplied by a number to make it zero, is zero.*
✓ **2/3*r=1**
✗ 2/3*r=2/3 *2/3*r=2/3 can't be correct because a multiplicative inverse is the number that multiplied by a number makes it 1, this number turned it into itself, which means it is the multiplicative identity, not inverse.*
✗ 2/3*r=-1 *2/3*r=-1 can't be correct because a multiplicative inverse is the number that multiplied by a number makes it 1, this r turned it into -1*

6.) "2005_8__10(2006/09/20 14:05:58)" (Problem ID: 13077) RADIO_BUTTON [MA - 2005 - Spring - 8]

No knowledge components have been assigned
Which of the following is closest to $(2^5*5^3)/33$
Answers: (Interface Type: RADIO_BUTTON)
✓ **120**
✗ 12
✗ 1200
✗ 5

(Problem ID: 13078) TEXT_FIELD [MA - 2005 - Spring - 8]

No knowledge components have been assigned
This is an order of operation problem, remember to properly follow the order of operations when simplifying this expression. What is the value of 2^5?
Answers: (Interface Type: TEXT_FIELD)
✓ **32**

Hint 1:
Powers of 2 are easy to multiply compared to other exponents, try multiplying it out by hand or in your head.
Hint 2:
Remember 2^5 is the same as 2*2*2*2*2
Hint 3:
2^5 is 32, enter 32

(Problem ID: 13079) RADIO_BUTTON [MA - 2005 - Spring - 8]

No knowledge components have been assigned

$$\frac{32(5^3)}{33}$$

Now we have the expression above. Notice that once we have done this that we have a 32 over a 33, which is very close to one, and since we are estimating we can ignore them. Now all we have to calculate is 5^3. Which of our original choices is 5^3 closest to?

Answers: (Interface Type: RADIO_BUTTON)

✗ 12
✓ **120**
✗ 1200
✗ 5

Hint 1:
5^3 is the same as 5*5*5
Hint 2:
5*5 is 25, multiply that by 5 to get our answer
Hint 3:
25*5 is 125 which is closest to 120, choose 120

7.) "2005_16_10(2006/09/20 15:06:33)" (Problem ID: 13080) TEXT_FIELD [MA - 2005 - Spring - 16]

No knowledge components have been assigned

On an airline, approximately 10% of the airline passengers who are booked for a flight do not show up for the flight. The airline has booked 160 passengers for a flight with a maximum seating of 135. How many of the 160 passengers booked for this flight will not have a seat, assuming 10% of the booked passengers do not show up?

Answers: (Interface Type: TEXT_FIELD)

✓ **9**

(Problem ID: 13081) TEXT_FIELD [MA - 2005 - Spring - 16]

No knowledge components have been assigned

This problem is best taken in a couple steps. The first step is to find how many of the 160 passengers will not show up. What is the number of passengers who do not show up?

Answers: (Interface Type: TEXT_FIELD)

✓ **16**

Hint 1:
How many passengers is 10% of the 160 passengers booked?
Hint 2:
10% is 1/10 of the total number
Hint 3:
Dividing 160 by 10 will give us the number of passengers who do not show.
Hint 4:
160/10 is 16. 16 passengers will not show up, enter 16.

(Problem ID: 13082) TEXT_FIELD [MA - 2005 - Spring - 16]

No knowledge components have been assigned

Now, since 16 of the 160 passengers will not show. How many passengers now, will show up?
Answers: (Interface Type: TEXT_FIELD)
✓ **144**

Hint 1:
Subtract the number of passengers who don't show from the total.
Hint 2:
What is 160-16?
Hint 3:
The number of passengers who show up is 144. Enter 144

(Problem ID: 13083) TEXT_FIELD [MA - 2005 - Spring - 16]

No knowledge components have been assigned

If 144 passengers show up to the flight, and the plane has room for 135 passengers, how many of them will not have a seat?
Answers: (Interface Type: TEXT_FIELD)
✓ **9**

Hint 1:
To find how many can't fit find the difference between the two numbers
Hint 2:
The difference between the numbers is 144-135=9. 9 is the number of passengers who show up but will not be able to get on the plane. Enter 9.

8.) "2005_41a_10(2006/09/21 10:14:16)" (Problem ID: 13131) TEXT_FIELD [MA - 2005 - SPRING - 41a]

No knowledge components have been assigned

$\left(\frac{4}{3}\right)^4$ Egyptian approximation

$\frac{355}{113}$ Chinese approximation

$\frac{22}{7}$ Archimedes' approximation (Greek)

In a report on the history of irrational numbers, Celine compared three different values that have been used to approximate π. The values are listed above.

Celine compared $(4/3)^4$, the approximation used by the Eqyptians, to 22/7, a value that she often uses for π. She converted both $(4/3)^4$ and 22/7 to decimals rounded to four decimal places (nearest ten-thousandth). To the nearest ten-thousandth, what is the absolute value of the difference between $(4/3)^4$ and 22/7?

Answers: (Interface Type: TEXT_FIELD)
✓ **0.0176**
✓ **.0176**

(Problem ID: 13132) TEXT_FIELD [MA - 2005 - SPRING - 41a]

No knowledge components have been assigned

This problem requires that we calculate each value in our calculator, and then subtract them. Lets start by calculating $(4/3)^4$ in your calculator, round to the nearest ten-thousandth place (four decimals). What value do we get?

Answers: (Interface Type: TEXT_FIELD)

✓ **3.1605**

Hint 1:
Remember, round up if the number in the 5th decimal position is 5 or higher, otherwise round down.

Hint 2:
$(4/3)^4$ comes out in your calculator looking like 3.160493827.... The 4 is in the ten-thousandth place, round it up, because of the 5 after it, and then enter your answer.

Hint 3:
$(4/3)^4$ rounds to 3.1605. Enter 3.1605

(Problem ID: 13133) TEXT_FIELD [MA - 2005 - SPRING - 41a]

No knowledge components have been assigned

Now, enter 22/7 into your calculator and round that to the ten-thousandth place. What value do we get?

Answers: (Interface Type: TEXT_FIELD)

✓ **3.1429**

Hint 1:
Remember, round up if the number in the 5th decimal position is 5 or higher, otherwise round down.

Hint 2:
22/7 comes out in your calculator looking like 3.142857143.... The 8 is in the ten-thousandth place, round it up, because of the 5 after it, and then enter your answer.

Hint 3:
22/7 rounds to 3.1429. Enter 3.1429

(Problem ID: 13134) TEXT_FIELD [MA - 2005 - SPRING - 41a]

No knowledge components have been assigned

Now, subtract our two decimal values, 3.1605 and 3.1429. What is your result?

Answers: (Interface Type: TEXT_FIELD)

✓ **0.0176**

✓ **.0176**

Hint 1:
Use your calculator to subtract 3.1429 from 3.1605.

Hint 2:
3.1605-3.1429 is 0.0176. Enter 0.0176 as your final answer.

9.) "2005_41b_10(2006/09/21 10:44:08)" (Problem ID: 13135) TEXT_FIELD [MA - 2005 - SPRING - 41b]

No knowledge components have been assigned

$\left(\frac{4}{3}\right)^4$ Egyptian approximation

$\frac{355}{113}$ Chinese approximation

$\frac{22}{7}$ Archimedes' approximation (Greek)

In a report on the history of irrational numbers, Celine compared three different values that have been used to approximate π. The values are listed above. Celine compared 355/113, the approximation used by the Chinese, to 22/7. She converted both 355/113 to a decimal rounded to four decimal places (nearest ten-thousandth). To the nearest ten-thousandth, what is the absolute value of the difference between 355/113 and 22/7?

Answers: (Interface Type: TEXT_FIELD)

✔ **.0013**

✔ **0.0013**

(Problem ID: 13136) TEXT_FIELD [MA - 2005 - SPRING - 41b]

No knowledge components have been assigned

This problem requires that we calculate each value in our calculator, and then subtract them. Try calculating 355/113 in your calculator and round to the nearest ten-thousandth place(four decimals). What value do we get?

Answers: (Interface Type: TEXT_FIELD)

✔ **3.1416**

Hint 1:
Remember, round up if the number in the 5th decimal position is 5 or higher, otherwise round down.

Hint 2:
355/113 come out in your calculator looking like 3.14159292.... The 5 is in the ten-thousandth place, round it up, because of the 5 after it, and then enter your answer.

Hint 3:
355/113 rounds to 3.1416. Enter 3.1416.

(Problem ID: 13137) TEXT_FIELD [MA - 2005 - SPRING - 41b]

No knowledge components have been assigned

Now, enter 22/7 into your calculator and round that to the ten-thousandth place. What value do we get?

Answers: (Interface Type: TEXT_FIELD)

✔ **3.1429**

Hint 1:
Remember, round up if the number in the 5th decimal position is 5 or higher, otherwise round down.

Hint 2:
22/7 come out in your calculator looking like 3.142857143.... The 8 is in the ten-thousandth place, round it up, because of the 5 after it, and then enter your answer.

Hint 3:
22/7 rounds to 3.1429. Enter 3.1429.

(Problem ID: 13138) TEXT_FIELD [MA - 2005 - SPRING - 41b]

No knowledge components have been assigned

Now, subtract our two decimal values, 3.1416 and 3.1429. What is your final result?

Answers: (Interface Type: TEXT_FIELD)

✓ **.0013**

✓ **0.0013**

Hint 1:

Use your calculator to subtract 3.1416 from 3.1429.

Hint 2:

3.1429-3.1416 is 0.0013. Enter 0.0013 as your final answer.

10.) "2005ma_2_10 (2006/09/21 11:10:00)" (Problem ID: 13141) RADIO_BUTTON

No knowledge components have been assigned

Answers: (Interface Type: RADIO_BUTTON)

11.) "2005ma_3_10(2006/09/21 12:56:08)" (Problem ID: 13152) RADIO_BUTTON [MA - 2005 - SPRING - 3]

No knowledge components have been assigned

Transportation to School

Type of Transportation	Number of Juniors	Number of Seniors
take the bus	284	73
walk/bicycle	30	26
travel by car	206	380
TOTAL	**520**	**479**

Tomika collected data about the types of transportation that the juniors and seniors at her high school use to get to school. The table above shows the data that she collected.

Based on the data in the table, which of the following is closest to the percent of juniors and seniors combined who take the bus to school?

Answers: (Interface Type: RADIO_BUTTON)

✗ 65

✗ 55

✓ **35**

✗ 15

(Problem ID: 13153) RADIO_BUTTON [MA - 2005 - SPRING - 3]

No knowledge components have been assigned

To find a percentage we need to know the part and the whole of the groups we're looking at. What is a good estimate of the total number of Juniors and Seniors?

Answers: (Interface Type: RADIO_BUTTON)

✓ **1000**

✗ 1200

✗ 450
✗ 500

Hint 1:
You can estimate the individual numbers of juniors and seniors and then add them
Hint 2:
520 + 479 is almost exactly 1000, even without rounding, with rounding it becomes 500+500
Hint 3:
The best choice would be 1000 because it is a very easy number to take percentages of and it is close to the actual value

(Problem ID: 13154) RADIO_BUTTON [MA - 2005 - SPRING - 3]

No knowledge components have been assigned

Now repeat the process for the number of juniors and seniors who take the bus. Which of the following is a good estimate of this new total?

Answers: (Interface Type: RADIO_BUTTON)

✓ **350**
✗ 100
✗ 300
✗ 600

Hint 1:
Estimate each individual number and then add.
Hint 2:
It might be best to round 73 down to 70.
Hint 3:
Rounding 284 to 280 and 73 to 70 gives us a value of 350 Juniors and Seniors who rode the bus.. Enter 350

(Problem ID: 13155) RADIO_BUTTON [MA - 2005 - SPRING - 3]

No knowledge components have been assigned

Now what is the percentage of Juniors and Seniors who rode the bus?

Answers: (Interface Type: RADIO_BUTTON)

✗ 15%
✗ 65%
✓ **35%**
✗ 55%

Hint 1:
Remember, percentage is done by dividing the part by the whole then multiplying by 100
Hint 2:
is the part of the whole 1000 students
Hint 3:
Divide 350 by 1000, then multiply by 100
Hint 4:
350/1000 =.35, multiply by 100 to find the correct percentage
Hint 5:
.35*100 is 35%. Choose 35%.

12.) "2005ma_4_10 (2006/09/21 13:24:36)" (Problem ID: 13160) RADIO_BUTTON [MA - 2005 - SPRING - 4]

No knowledge components have been assigned

$(-1)^5(2 \cdot 4^2)$

What is the value of the expression above?

Answers: (Interface Type: RADIO_BUTTON)

✔ **-32**

✘ 64

✘ -64

✘ 32

(Problem ID: 13161) TEXT_FIELD [MA - 2005 - SPRING - 4]

No knowledge components have been assigned

This is an order of operation problem; remember to properly follow the order of operations when simplifying this expression. I would suggest you simplify the right parentheses first. What does the interior of the parentheses reduce to?

Answers: (Interface Type: TEXT_FIELD)

✔ **32**

Hint 1:

Remember, within parentheses you must also follow the order of operations, so do exponents first

Hint 2:

4^2 simplifies to 16, now multiply that by 2

Hint 3:

The right parenthesis simplifies to 32. Enter 32

(Problem ID: 13162) TEXT_FIELD [MA - 2005 - SPRING - 4]

No knowledge components have been assigned

Now we have $(-1)^5(32)$. What is the value of the reduced expression?

Answers: (Interface Type: TEXT_FIELD)

✔ **-32**

Hint 1:

Remember, exponents of -1 are always either 1 or -1.

Hint 2:

When you multiply -1 times -1 it becomes positive 1, multiply it by -1 again it becomes -1.

Hint 3:

When -1 is multiplied by -1 an *odd* number of times it stays -1, when multiplied by -1 an *even* number of times it becomes 1.

Hint 4:

The left expression becomes -1 because it is multiplied an odd number of times, which multiplied by 32 becomes -32. Enter 32

13.) "2005ma_10_10(2006/09/21 13:45:23)" (Problem ID: 13163) RADIO_BUTTON [MA - 2005 - SPRING - 10]

No knowledge components have been assigned

What is the value of the expression below?

$(3^2-1)(1-3^2)$

Answers: (Interface Type: RADIO_BUTTON)
✗ 0
✗ -25
✓ **-64**
✗ 64

(Problem ID: 13166) TEXT_FIELD [MA - 2005 - SPRING - 10]

No knowledge components have been assigned
This is an order of operation problem; remember to properly follow the order of operations when simplifying this expression. What does the expression within the first parenthesis reduce to?
Answers: (Interface Type: TEXT_FIELD)
✓ **8**

Hint 1:
Remember, follow the order of operations within the parenthesis as well.
Hint 2:
Square the 3 then subtract 1 from that
Hint 3:
The first parenthesis reduces to 8. Enter 8

(Problem ID: 13167) TEXT_FIELD [MA - 2005 - SPRING - 10]

No knowledge components have been assigned
We will continue in the same fashion to simplify the right side. What does the second parenthesis reduce to?
Answers: (Interface Type: TEXT_FIELD)
✓ **-8**

Hint 1:
The second parenthesis is a little more difficult and requires the understanding of negative numbers
Hint 2:
We know 3^2 is 9, what is 1-9?
Hint 3:
1-9 is 9 less than 1, or -8. Enter -8

(Problem ID: 13168) TEXT_FIELD [MA - 2005 - SPRING - 10]

No knowledge components have been assigned
Now, let's multiply the two sides together as our final step. What is the product of 8 and -8?
Answers: (Interface Type: TEXT_FIELD)
✓ **-64**

Hint 1:
8*8 is positive 64.
Hint 2:
Since one of the numbers is negative the answer will be negative
Hint 3:
8*-8 is -64, enter -64

14.) "2005Nov_6_102006/09/27 21:40:15)" (Problem ID: 13510) RADIO_BUTTON [MA - 2005 - FALL - 6]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

3^5*3^3

Answers: (Interface Type: RADIO_BUTTON)

✗ 3^{15}
✓ **3^8**
✗ 9^8
✗ 9^{15}

(Problem ID: 13511) RADIO_BUTTON [MA - 2005 - FALL - 6]

No knowledge components have been assigned

Let's take 3^5*3^3 and write it out in expanded notation to see what its value simplifies to. Starting with 3^5, which of the following is its expanded notation?

Answers: (Interface Type: RADIO_BUTTON)

✗ 3*5
✗ 3+3+3+3+3
✓ **3*3*3*3*3**
✗ 5*5*5

Hint 1:
Remember, exponents are a simplified method of writing multiplication of one number times itself.

Hint 2:
The base number is the number multiplied by itself and the exponent is the number of times it is multiplied by itself.

Hint 3:
3^5 would be written as 3 multiplied by itself 5 times, 3*3*3*3*3. Choose 3*3*3*3*3

(Problem ID: 13512) RADIO_BUTTON [MA - 2005 - FALL - 6]

No knowledge components have been assigned

So we know 3^5 means 3 times itself 5 times. Knowing that, what is 3^5*3^3?

Answers: (Interface Type: RADIO_BUTTON)

✗ 3^{15}
✓ **3^8**
✗ 9^8
✗ 9^{15}

Hint 1:
If 3^5 is 3*3*3*3*3, then think about what 3^5*3^3 would be written like.

Hint 2:
3^5*3^3 would be written as (3*3*3*3*3)*(3*3*3) or 3*3*3*3*3*3*3*3. Which of the

choices is that equivalent to?
Hint 3:
There is 8 threes multiplied together, so 3*3*3*3*3*3*3*3 would equal 3^8, choose 3^8 from the original choices.

15.) "2005nov_1_10 (2006/09/27 22:17:22)" (Problem ID: 13517) RADIO_BUTTON [MA - 2005 - FALL - 1]

No knowledge components have been assigned

What is the value of the expression below?

$7(1-3^2)$

Answers: (Interface Type: RADIO_BUTTON)
✗ -35
✓ **-56**
✗ 28
✗ 70

(Problem ID: 13524) TEXT_FIELD [MA - 2005 - FALL - 1]

No knowledge components have been assigned

Order of Operations: This is an order of operation problem; remember to properly follow the order of operations when simplifying this expression. What is the value of the expression within the parenthesis?(The blue part of the expression below)

$7(1-3^2)$

Answers: (Interface Type: TEXT_FIELD)
✓ **-8**

Hint 1:
Remember to follow the order of operations within the parenthesis as well.
Hint 2:
Starting with $7(1-3^2)$, we can reduce the 3^2 to 3*3, or 9.
Hint 3:

Now we have reduced the original expression like this:

$7(1-3^2)$

$7(1-9)$

The next step would be to subtract 9 from 1 to get us what is inside the parenthesis

Hint 4:

Subtracting 9 from 1 gets us one step further:

$7(1-3^2)$

7(1-9)

7(-8)

As we can see the parenthesis reduces to -8, enter -8 and click submit

(Problem ID: 13525) RADIO_BUTTON [MA - 2005 - FALL - 1]
No knowledge components have been assigned

So far we have complete the following steps.

$7(1-3^2)$

7(1-9)

7(-8)

So, now that we have 7(-8). What is the product of these two numbers?

Answers: (Interface Type: RADIO_BUTTON)
✗ 70
✗ 28
✓ **-56**
✗ -35

Hint 1:
Remember, a negative number multiplied by a positive number will give us a negative number.
Hint 2:
7*8 is 56, so 7*-8 is -56.
Hint 3:
The answer is -56, enter -56

16.) "2005nov_3_10 (2006/09/27 22:55:57)" (Problem ID: 13535) RADIO_BUTTON [MA - 2005 - FALL - 3]
No knowledge components have been assigned

The distance along the walking trail behind Jessica's school is approximately 6,290 feet. Jessica calculated the mean length of her walking steps to be 2.9 feet.

Which of the following is closest to the number of steps Jessica would take to walk the entire trail?

Answers: (Interface Type: RADIO_BUTTON)
✗ 1,800 steps
✗ 18,000 steps
✓ **2,000 steps**

✗ 200 steps

(Problem ID: 13536) RADIO_BUTTON [MA - 2005 - FALL - 3]

No knowledge components have been assigned

The goal of this problem is proper estimation. So let's start by estimating the values given to us. What is a good estimate for the length of one of Jessica's steps?

Answers: (Interface Type: RADIO_BUTTON)

✗ 2 *That estimation is too low, 2.9 is much closer to a different whole number.*

✗ 4 *THat estimation is too high. Try getting a lower whole number closer to 2.9.*

✓ **3**

✗ 2.5 *That estimation is too low. Try rounding it up.*

(Problem ID: 13537) RADIO_BUTTON [MA - 2005 - FALL - 3]

No knowledge components have been assigned

Now that we have estimated the distance of Jessica's step why don't we try and find a good estimate for 6290 that is easier to divide by 3(our estimate for 2.9). What would be a good estimate for 6290 of these choices?

Answers: (Interface Type: RADIO_BUTTON)

✗ 5500 *5500 is too low of an estimation, it is also not easy to divide by 3, try using a number closer to 6290 and divisible by 3*

✓ **6000**

✗ 6152 *6152 does not make sense as an estimation, it is not rounded or easier to use in any way.*

✗ 6500 *6500 This estimation would work, but it is a hard number to divide by 3, why not try rounding down to something easier to divide by 3*

(Problem ID: 13538) RADIO_BUTTON [MA - 2005 - FALL - 3]

No knowledge components have been assigned

Now that we have estimated Jessica's distance to 6000 ft and her step length to 3 feet, how many steps does Jessica take?

Answers: (Interface Type: RADIO_BUTTON)

✗ 1,800 steps

✓ **2,000 steps**

✗ 18,000 steps

✗ 200 steps

Hint 1:

Try to divide 6000 by 3

Hint 2:

To calculate 6000/3 start by doing 6/3

Hint 3:

6/3 is 2, so 6000/3 is 2000, choose 2000

17.) "2005nov_3_10 (2006/09/27 22:55:57)" (Problem ID: 13539) RADIO_BUTTON [MA - 2005 - FALL - 3]

No knowledge components have been assigned

$\sqrt{65} - \sqrt[3]{65}$

Which of the following is closest to the value of the expression shown above?

Answers: (Interface Type: RADIO_BUTTON)
✗ 5
✓ **4**
✗ 2
✗ 3

(Problem ID: 13546) TEXT_FIELD [MA - 2005 - FALL - 3]

No knowledge components have been assigned

The key to doing this problem is to estimate the values of √(65) and $\sqrt[3]{(65)}$. We will start with the left most root. What number near 65 would be an easy number to find the square root of?

Answers: (Interface Type: TEXT_FIELD)
✓ **64**

Hint 1:
If you are having a problem with finding an easy perfect square, then try squaring some low numbers and see if any get close to 65, try 6^2, 7^2, 8^2, and 9^2

Hint 2:
6^2 is 36, 7^2 is 49, 8^2 is 64, and 9^2 is 81, which of these is close to 65?

Hint 3:
8^2 or 64 is very close to 65. Enter 64

(Problem ID: 13547) TEXT_FIELD [MA - 2005 - FALL - 3]

No knowledge components have been assigned

We can estimate √65 as √64. Now we should see if the same estimation works for the $\sqrt[3]{65}$. What number multiplied by itself 3 times equals 64?

Answers: (Interface Type: TEXT_FIELD)
✓ **4**

Hint 1:
Since most of us don't memorize very many cubes, try cubing some very low numbers. Try 2,3,4, and 5

Hint 2:
2^3 is 8, 3^3 is 27, 4^3 is 64, and 5^3 is 125. So 4 cubed is very close to 64. Enter 4.

(Problem ID: 13548) RADIO_BUTTON [MA - 2005 - FALL - 3]

No knowledge components have been assigned

Now, let's reduce what we have estimated, ?(64)-^{3}?(64), what does this expression reduce to from the original choices?

Answers: (Interface Type: RADIO_BUTTON)
✓ **4**
✗ 2
✗ 3
✗ 5

Hint 1:
We have already determined what the value for our roots our, subtract those two values.

Hint 2:
√(64)-$\sqrt[3]{(64)}$ is 8-4, which is equal to 4. Choose 4.

18.) "2005nov_10_10(2006/09/27 23:29:56)" (Problem ID: 13553) RADIO_BUTTON [MA - 2005 - FALL - 10]

No knowledge components have been assigned

Which statement about 4√(79) is true?

Answers: (Interface Type: RADIO_BUTTON)

✗ 28 < 4√(79) < 32 *√79 is between 8 and 9, because it less than √81, which is equal to 9, and bigger than √64, which is equal to 8. So four times it is bigger than 4*8=32, so it must be bigger than 32 not less than as stated in the inequality.*

✓ **32< 4√(79) < 36**

✗ 4√(79) < 28 *√79 is slightly less than 9, because √81 is 9, and four times nine is bigger than 28, this choice is incorrect.*

✗ 4√(79) > 36 *√79 is slightly less than 9, because √81 is 9, if you multiply it by 4 it will be slightly less than 4*9, which is equal to 36, so this answer is incorrect because it states that 4√79 is bigger than 36*

19.) "2005nov_13_10(2006/09/27 23:53:17)" (Problem ID: 13564) RADIO_BUTTON [MA - 2005 - FALL - 13]

No knowledge components have been assigned

$\sqrt{(n^2)} = 10$

Which value of *n* makes the above equation true?

Answers: (Interface Type: RADIO_BUTTON)

✗ 100 *D. The key to this problem is to notice that a square root cancels a squared number, in other words the square root of a squared number is itself. 100≠10, so this answer is incorrect*

✗ 5 *A. The key to this problem is to notice that a square root cancels a squared number, in other words the square root of a squared number is itself. 5≠10, so this answer is incorrect*

✓ **10**

✗ 20 *C. The key to this problem is to notice that a square root cancels a squared number, in other words the square root of a squared number is itself. 20≠10, so this answer is incorrect*

20.) "2005nov_14_10 (2006/09/28 00:09:34)" (Problem ID: 13565) RADIO_BUTTON [MA - 2005 - FALL - 14]

No knowledge components have been assigned

What is the value of the expression below?

$2(25\text{-}15)^2$

Answers: (Interface Type: RADIO_BUTTON)

✗ 100

✓ **200**

✗ 400

✗ 300

(Problem ID: 13580) TEXT_FIELD [MA - 2005 - FALL - 14]

No knowledge components have been assigned

This is an order of operation problem; remember to properly follow the order of operations when simplifying this expression. Our first step is inside the parenthesis. What is 25-15?

Answers: (Interface Type: TEXT_FIELD)
✓ **10**

Hint 1:
We are starting inside the parenthesis because the order of operations is Parenthesis, then Exponents, going left to right Multiplication/Division, from left to right Addition/Subtraction.
Hint 2:
25-15 is 10. Enter 10

(Problem ID: 13581) TEXT_FIELD [MA - 2005 - FALL - 14]

No knowledge components have been assigned

The process so far has been this:

$2(25-15)^2$

$2(10)^2$

Our next step would be to square the 10. What is 10^2?

Answers: (Interface Type: TEXT_FIELD)
✓ **100**

Hint 1:
We are now calculating the exponent because our order of operations says that we calculate exponents after all parenthesis are gone.
Hint 2:
10^2 is equal to 100. Enter 100 as the answer to 10^2

(Problem ID: 13582) RADIO_BUTTON [MA - 2005 - FALL - 14]

No knowledge components have been assigned

To recap, we have taken these steps:

$2(25-15)^2$

$2(10)^2$

$2(100)$

Now, which of the original choices is this final step equal to?

Answers: (Interface Type: RADIO_BUTTON)
✗ 400
✓ **200**
✗ 300
✗ 100

Hint 1:
Our final step is the multiplication because it comes after parenthesis and exponents. If we

had followed a different order we would have come out with an incorrect answer.
Hint 2:
2(100) is 200. Choose 200 from our original choices.

21.) "2005nov_23_10 (2006/09/28 01:17:18)" (Problem ID: 13596) RADIO_BUTTON

No knowledge components have been assigned
In which equation below is c=0 the **only** solution?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. c + 4 = 4 + c
✓ **B. c + 4 = 4**
✗ C. c + (-c) = 0
✗ D. c + 4 = c

(Problem ID: 13619) RADIO_BUTTON

No knowledge components have been assigned
To answer this problem it is best if we go through each answer and check whether it works or not. First lets see if we can eliminate any of them by substituting in c=0 and seeing if it is not true. Which answer is not true for c=0?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. c + 4 = 4 + c
✗ B. c + 4 = 4
✗ C. c + (-c) = 0
✓ **D. c + 4 = c**

(Problem ID: 13620) RADIO_BUTTON

No knowledge components have been assigned
Now, for the remaining three, lets try substituting in some simple, non-zero number to see if it works, because if it does then they can't have 0 as their only solution. Try substituting c=1 into the remaining equations. Which of them is the only one that this does not work for?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. c + 4 = 4 + c
✓ **B. c + 4 = 4**
✗ C. c + (-c) = 0

Hint 1:
For A, c + 4 = 4 +c, when we substitute in c=1 we get 5=5, which is true. This means that c=0 is not the only solution, because c=1 is a solution.
Hint 2:
For C, c+(-c)=0, when we substitute in c=1 we get 0=0, which is true. Therefore c=0 is not the only solution.
Hint 3:
For B, c+4=4,, when we substitute c=1 we get 5=4, which is not true. This makes sense, because what number when added to any other number only returns that second number? The answer is 0, this is called the addititve identity. Choose B as your final answer.

22.) "2005mar_12_10(2006/09/28 01:43:37)" (Problem ID: 13621) RADIO_BUTTON

No knowledge components have been assigned

$\sqrt{7^2 + 8^2}$

The expression above was used to approximate a distance in miles

Based on the expression which of the following is closest to the distance?

Answers: (Interface Type: RADIO_BUTTON)
✗ 10 miles
✗ 11.5 miles
✓ **10.5 miles**
✗ 15 miles

(Problem ID: 13634) TEXT_FIELD

No knowledge components have been assigned

Remember, we do not have the use of our calculator, so proper estimation is very important. First lets simplify what is underneath the square roots. What is 7^2+8^2? Remember to properly follow the order of operations.

Answers: (Interface Type: TEXT_FIELD)
✓ **113**

Hint 1:
Make sure you calculate the exponents first, before adding, because that is the proper order of operations.

Hint 2:
7^2 is 49 and 8^2 is 64.

Hint 3:
Now add the two values of 49 and 64.

Hint 4:
49 + 64 = 113, enter 113.

(Problem ID: 13635) RADIO_BUTTON

No knowledge components have been assigned

$\sqrt{113}$

Now, which estimate is the closest to the expression above?

Answers: (Interface Type: RADIO_BUTTON)
✗ 10
✓ **10.5**
✗ 11
✗ 15

Hint 1:
Try comparing the number within the square root to some of the answers squared. (For example, 10^2 or 15^2)

Hint 2:
10^2 is 100 and 11^2 is 121. 113 lies between these two numbers

Hint 3:

The answer is between 10 and 11 so therefore 10.5 is the closet to the actual value. Choose 10.5

23.) "2005mar_23_10 (2006/09/28 02:06:37)" (Problem ID: 13636) RADIO_BUTTON

No knowledge components have been assigned

$$2000\left(1+\frac{0.04}{2}\right)^3$$

The expression above represents the amount of money in Jaime's savings account.

Which of the following is closest to the amount of money in Jaime's savings account?

Answers: (Interface Type: RADIO_BUTTON)

✗ $6240
✗ $6120
✗ $2250
✓ **$2120**

(Problem ID: 13649) TEXT_FIELD

No knowledge components have been assigned

This is an order of operation problem, the correct order is first parenthesis, then exponents, then from left to right multiplication/division, and finally left to right addition/subtraction. What is the value of the expression within the parenthesis?

Answers: (Interface Type: TEXT_FIELD)

✓ **1.02**

Hint 1:
Simplify the fraction(division) before doing the addition
Hint 2:
The fraction simplifies to 0.02 with your calculator or by hand
Hint 3:
Adding 1 to .02 gives use 1.02. Enter 1.02

(Problem ID: 13650) TEXT_FIELD

No knowledge components have been assigned

The expression now looks like this $2000(1.02)^3$. Now take the next step in the order of operations. What does the expression to the right of 2000 simplify to? (Round to the 3rd decimal place, the thousandth place)

Answers: (Interface Type: TEXT_FIELD)

✓ **1.061**

Hint 1:
The only step required is to cube what is now within the parenthesis
Hint 2:
Using your calculator cube 1.02, enter the value to the 3rd decimal place
Hint 3:
The answer will be 1.061, Enter 1.061

(Problem ID: 13651) RADIO_BUTTON

No knowledge components have been assigned

Now what we have done looks like this:

$2000(1+0.04/2)^3$

$2000(1.02)^3$

$2000(1.061)$

simplify this last step to find how much Jaime's account has and choose it from the original answers.

Answers: (Interface Type: RADIO_BUTTON)

✗ $2250
✓ **$2120**
✗ $6240
✗ $6120

Hint 1:
Multiply 2000 times 1.061
Hint 2:
2000*1.125 is 2250
Hint 3:
Choose 2250, the amount that Jaime's account now holds.

24.) "2005mar_40_10 (2006/09/28 02:32:19)" (Problem ID: 13652) RADIO_BUTTON

No knowledge components have been assigned

When a, b, and c are real numbers, which of the following equations is always true?

Answers: (Interface Type: RADIO_BUTTON)

✗ abc = -cba *This is not always true because if you use all positive numbers the left side would be positive and the right side would be negative, which makes them unequal*
✓ **a(b - c) = ab - ac**
✗ a - (b - c) = (a - b) -c *Try entering some numbers, 1, 2, and 3 in for a, b, and c. We find that this answer, although it looks like the associative property (putting terms in any order), which we know is true for addition, is not true for subtraction, in which case it is not true.*
✗ a - bc = bc - a *This is not always true because if a is very large and bc is very small the left side of the equation would be a very large number, while the right side would be negative.*

25.) "2000_2_10(2006/09/28 03:14:35)" (Problem ID: 13675) RADIO_BUTTON

No knowledge components have been assigned

	average miles per gallon in the city	average miles per gallon on the highway
Car #1	20	35
Car #2	25	30
Car #3	24	34
Car #4	26	31

Mark drives 25% of the time in the city and 75% of the time on the highway. Which of the four cars listed below will give him the greatest number of miles per gallon of gas?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. Car#1
✗ B. Car #2
✓ **C. Car #3**
✗ D. Car #4

(Problem ID: 14433) TEXT_FIELD

No knowledge components have been assigned

The best way to do answer this question is to test each car and figure out how many miles per gallon Mark gets on average for each individual car. How many miles per gallon would Mark get from Car #1? (Enter as a decimal)

Answers: (Interface Type: TEXT_FIELD)

✓ **31.25**

Hint 1:
We know the percentage of his total driving each type of driving takes up. If city driving takes up 25% of Mark's driving, then the gas mileage for city driving affects 25% of his total gas mileage for both.

Hint 2:
Multiply 25% by 20 and 75% by 35 to find how much each individual type of driving affects his total gas mileage.

Hint 3:
25%*20 is 5 and 75%*35 is 26.25. Add these together to get the total gas mileage Mark gets for Car #1

Hint 4:
5 + 26.25 is 31.25, enter 31.25, the gas mileage for Mark using the first car.

(Problem ID: 14434) RADIO_BUTTON

No knowledge components have been assigned

Follow this same process for the remaining cars, which of the following is the gas mileage of Car #1, Car #2, Car #3, and Car #4, in order?

Answers: (Interface Type: RADIO_BUTTON)

✗ 32.25, 27.5, 29.25, 30.75
✗ 28.75, 31.25, 31, 29.5
✗ 32, 29, 28.25, 32.75
✓ **31.25, 28.75, 31.5, 29.75**

Hint 1:

Remember, multiply 25% by the city mileages of each car and add that to 75% of the highway mileages.
Hint 2:
Car #1 we know gets 31.25. Calculating each car we get 28.75 for Car #2, 31.5 for Car #3, and 29.75 for Car #4. Choose the answer with the numbers in this order.

(Problem ID: 14435) RADIO_BUTTON

No knowledge components have been assigned
Now looking at the total mileage for each car, which of the cars is most efficient for Mark?
Answers: (Interface Type: RADIO_BUTTON)
✗ B. Car #2
✗ D. Car #4
✓ **C. Car #3**
✗ A. Car #1

Hint 1:
Car #3 has the highest value with 31.5 miles per gallon. Choose Car#3

26.) "2000_3_10 (2006/10/30 22:20:06)" (Problem ID: 14436) RADIO_BUTTON

No knowledge components have been assigned
If 3(2r-5) = 27, then 2r-5 equals
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 30
✗ B. 24
✗ C. 81
✓ **D. 9**

(Problem ID: 14437) RADIO_BUTTON

No knowledge components have been assigned
Which of the following steps would we use to isolate 2r-5 on the left side of the equation?
Answers: (Interface Type: RADIO_BUTTON)
✗ Subtract 27 from both sides *We need to isolate (2r-5), subtracting 27 from both sides brings everything to the same side as (2r-5)*
✓ **Divide both sides by 3**
✗ Multiply both sides by 3 *Remember, we need to do the opposite of what is being done in order to isolate part of an equation. You need to divide by 3 in order to cancel out the 3.*
✗ Distribute the 3 inside the parenthesis *We are trying to isolate (2r-5) if you distribute the 3 it would complicate the equation.*

(Problem ID: 14438) RADIO_BUTTON

No knowledge components have been assigned
We have followed these steps to isolate 2r-5.

3(2r-5)=27

3(2r-5)/3=27/3

(2r-5)=27/3

Now which of the following, original answers is the value of 2r-5

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 30
✗ B. 24
✗ C. 81
✓ **D. 9**

Hint 1:
27/3 is equal to 9
Hint 2:
Because we now have 2r-5 on the left side of the equation we can see that 2r-5 is equal to 9. Choose 9.

27.) "2000_18_10(2006/10/30 22:45:56)" (Problem ID: 14439) RADIO_BUTTON [MA - 2000 - Spring - 18]

No knowledge components have been assigned

○	a	b	c	d
a	d	c	b	a
b	c	d	a	b
c	b	a	d	c
d	a	b	c	d

The identity for the operation of addition is 0 since 0+x =x and x+0=x for any real number x. The operation O is defined by the table above.

What is the identity element for the operation O?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. a *That is incorrect, a is not the identity. To explain, a(from the top row), when operated on with a(from the left column) becomes d (the arrow signifies this change), as you can see in the picture. Remember, an identity has to return any value exactly as it was in order for it to be an identity. In this case it changed a to d., so it is not the identity.*
✗ B. b *That is incorrect, b is not the identity. To explain, a (from the top row), when operated on with b (from the left column) becomes c (the arrow signifies this change), as you can see in the picture. Remember, an identity has to return any value exactly as it was in order for it to be an identity. In this case it changed a to c., so it is not the identity.*
✗ C. c *That is incorrect, c is not the identity. To explain, a(from the top row), when operated on with c (from the left column) becomes b (the arrow signifies this change), as you can see in the picture. Remember, it has to return any value exactly as it was in order for it to be an identity. In this case it changed c to a., so it is not the identity.*
✓ **D. d**

28.) "2000_20_10 (2006/10/30 22:59:13)" (Problem ID: 14441) RADIO_BUTTON

No knowledge components have been assigned

A. $\frac{1}{3}$

B. $0.\overline{304}$

C. $\sqrt{0.9216}$

D. $\frac{\pi}{10}$

Which of the above is an irrational number?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. a
✗ B. b
✗ C. c
✓ **D. d**

(Problem ID: 15239) RADIO_BUTTON

No knowledge components have been assigned

The key to this is knowing the definition of an irrational number. Which of the following describes an irrational number?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A number that can not be written as a fraction or a repeating decimal.**
✗ Any fraction
✗ A number that can be written as a fraction or repeating decimal
✗ A number that does not have a decimal, such as 2 or 55

(Problem ID: 14442) RADIO_BUTTON

No knowledge components have been assigned

A. $\frac{1}{3}$

B. $0.\overline{304}$

C. $\sqrt{0.9216}$

D. $\frac{\pi}{10}$

So, we just found out that an irrational number is any number that can not be written as a fraction or a repeating decimal. Its decimals continue on indefinitely never repeating. With that in mind, which of the answers is irrational?

Answers: (Interface Type: RADIO_BUTTON)

✗ C. c *$\sqrt{0.9216}$ when calculated equals .96. .96 is a terminating decimal there it is not irrational.*
✓ **D. d**
✗ B. b *0.304304304… is a repeating decimal, the definition of irrational numbers says they cannot repeat, so this is not the correct choice.*

✗ A. a *1/3 is a fraction, anything that can be written as a fraction is rational, so this is not the correct choice*

29.) "2000_21a_10 (2006/10/30 23:10:10)" (Problem ID: 14443) TEXT_FIELD

No knowledge components have been assigned

An automobile is purchased for $18,000. Its value decreases each year according to the following schedule:

The car's value decreases by 30% in the first year.

After the first year, its value decreases by 20% each year.

What is the value of this car at the end of one year?

Answers: (Interface Type: TEXT_FIELD)
✓ **12600**

(Problem ID: 14444) TEXT_FIELD

No knowledge components have been assigned

To calculate the amount the automobile's value decreases after one year we have to look at the first rule:

The car's value decreases by 30% in the first year.

Since only one year has passed we have to find what $18,000, decreased by 30% is. How much is the value of the car going to decrease in the first year?

Answers: (Interface Type: TEXT_FIELD)
✓ **5400**

Hint 1:
You need to find 30% of 18,000
Hint 2:
To find 30% of 18,000 multiply 18,000 by .3
Hint 3:
18,000 * .3 is 5400. Enter 5,400

(Problem ID: 14445) TEXT_FIELD

No knowledge components have been assigned

Now, we know that the cost of the car decreased by 5400. So what is our final cost of the car, after one year?.

Answers: (Interface Type: TEXT_FIELD)
✓ **12600**

Hint 1:
Subtract 5400 from 18,000

Hint 2:
18,000 – 5400 is 12,600. Enter 12,600

30.) "2000_21b_10(2006/10/31 09:25:27)" (Problem ID: 14449) RADIO_BUTTON [MA - 2000 - SPRING - 21b]

No knowledge components have been assigned

An automobile is purchased for $18,000. Its value decreases each year according to the following schedule:

The car's value decreases by 30% in the first year.

After the first year, its value decreases by 20%, of its new value, each year.

During which year will the car's value decrease to less than half its original price?

Answers: (Interface Type: RADIO_BUTTON)
✗ After the 2nd year
✗ After the 4th year
✗ After the 5th year
✓ **After the 3rd year**

(Problem ID: 14450) TEXT_FIELD [MA - 2000 - SPRING - 21b]

No knowledge components have been assigned

Let's start by calculating the amount the automobile's value decreases after one year, to do so we have to look at the first rule:

The car's value decreases by 30% in the first year.

So, what is the new cost of the car after one year?

Answers: (Interface Type: TEXT_FIELD)
✓ **12600**

Hint 1:
To start let's fine the amount the car decreased in value, 30% of 18,000
Hint 2:
To find 30% of 18,000 multiply 18,000 by .3
Hint 3:
18,000 * .3 is 5400. That is the amount the car *decreased* in value, what we need is the new value of the car.
Hint 4:
Subtract 5400, the value the car dropped, from 18000, the original value, to find its new value
Hint 5:
18,000 – 5400 is 12,600. Enter 12600

(Problem ID: 14452) TEXT_FIELD [MA - 2000 - SPRING - 21b]

No knowledge components have been assigned

Now we know how much the car will cost after the first year. It now costs $12,600, what is the

new value if another year passes?
Answers: (Interface Type: TEXT_FIELD)
✓ **10080**

Hint 1:
Remember, the car decreases in value by only 20% now.
Hint 2:
20% of 12600 is 2520, subtract that from 12,600
Hint 3:
12,600 - 2520 = 10080. Enter 10080

(Problem ID: 14453) RADIO_BUTTON [MA - 2000 - SPRING - 21b]

No knowledge components have been assigned

Repeating this process, how many years total have you calculated when the car becomes worth less than 50% of its original value(less than $9,000)? Remember to count the first year.
Answers: (Interface Type: RADIO_BUTTON)
✗ After the 5th year
✗ After the 2nd year
✗ After the 4th year
✓ **After the 3rd year**

31.) "2000_21c_10(2006/10/31 09:36:54)" (Problem ID: 14454) RADIO_BUTTON

No knowledge components have been assigned

An automobile(Car 1) is purchased for $18,000. Its value decreases each year according to the following schedule:

The car's value decreases by 30% in the first

year.

After the first year, its value decreases by 20%, of its new value, each year.

Suppose the value of another car(Car 2), which also costs $18,000, decreases at the rate of 25% each year. Which car would have the greater value 3 years after it was purchased?

Answers: (Interface Type: RADIO_BUTTON)
✓ **Car 1**
✗ Car 2

(Problem ID: 14455) RADIO_BUTTON

No knowledge components have been assigned

Let's start by calculating the amount of the first automobileA?s value decrease in value after one year, to do so we have to look at the first rule:

The car's value decreases by 30% in the first year.

To do so we have to find what $18,000, decreased by 30% is. Before we answer that, what is 30% of 18,000?

Answers: (Interface Type: RADIO_BUTTON)

✓ **5400**

Hint 1:
To find 30% of 18,000 multiply 18,000 by .3
Hint 2:
18,000 * .3 is 5400. Enter 5,400

(Problem ID: 14456) TEXT_FIELD

No knowledge components have been assigned

Now, we know that 30% of 18000 is 5400, and we know that 18000 is decreased by that amount. So what is our final cost of the car, after one year?

Answers: (Interface Type: TEXT_FIELD)

✓ **12600**

Hint 1:
Subtract 5400 from 18,000
Hint 2:
18,000 – 5400 is 12,600. Enter 12,600

(Problem ID: 14457) TEXT_FIELD

No knowledge components have been assigned

Now we know how much the car will cost after the first year. It now costs $12,600, what is the new value if two more years pass?

Answers: (Interface Type: TEXT_FIELD)

✓ **8064**

Hint 1:
Remember, the car decreases in value by only 20% now.
Hint 2:
20% of 12600 is 2520, subtract that from 12,600
Hint 3:
12,600 - 2520 = 10080
Hint 4:
20% of 10080 is 2016, subtracting that from 10080 gets us $8064 for the value of our car after 3 years.

(Problem ID: 14458) TEXT_FIELD

No knowledge components have been assigned

We will repeat this process for the second car, but this time using only a 25% decrease every year. What is the value of the 2nd car after 3 years?

Answers: (Interface Type: TEXT_FIELD)

✓ **7593.75**

Hint 1:
For the first year we take the original value and subtract 25% of itself from that. So, 25% of 18000 is 4500. 18,000 – 4,500 is 13500. Do this two more times for the remaining two years.
Hint 2:
The second year we use 13500. So, 25% of 13500 is 3375. 13500 – 3375 is 10125
Hint 3:
The final year is done the same way. 25% of 10125 is 2531.25, subtracted from 10125 we get the final value of the 2nd car as 7593.75. Enter 7593.75

(Problem ID: 14459) RADIO_BUTTON

No knowledge components have been assigned

Finally, our first car is worth $8064 after three years, and the second is worth $7,593.75. Which of the two cars has a greater value after three years?

Answers: (Interface Type: RADIO_BUTTON)

✓ **Car 1**

✗ Car 2

32.) "2000_25_10 (2006/10/31 09:49:01)" (Problem ID: 14460) RADIO_BUTTON [PA - 2005 - Spring - 7]

No knowledge components have been assigned

Number of Points	3	4	5	6	...	10	11
Number of Line Segments	3	6	10	15	...	45	?

The above table shows the total number of line segments that can be drawn connecting two points in a set of coplanar, non collinear points. How many line segments can be drawn connecting two points in a set of 11 non collinear points?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 55**

✗ B. 50

✗ C. 48

✗ D. 110

(Problem ID: 14461) TEXT_FIELD [PA - 2005 - Spring - 7]

No knowledge components have been assigned

To answer this question we should recognize a pattern in the table given. It is impractical to actually do what they are saying and try and connect 11 points and count how many lines it creates. So, let's try finding the value for 7 points. What is the value for 7 points?

Answers: (Interface Type: TEXT_FIELD)

✓ **21**

(Problem ID: 14462) RADIO_BUTTON [PA - 2005 - Spring - 7]

No knowledge components have been assigned

Now that we can see the pattern, which of the original answer is the value the number of line segments created by 11 points?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 55**

✗ B. 50

✗ C. 48

✗ D. 110

Hint 1:

Remember, the pattern is that the column to the left adds up to the new value of line segments.

Hint 2:

So, since the column to the left of the one with 11 points has a 10 and a 45, if we add these

two it should be the correct answer.
Hint 3:
10 + 45 is 55, which is one of our answers, the correct one. Choose 55.

33.) "2000_27_10 (2006/10/31 10:00:23)" (Problem ID: 14463) RADIO_BUTTON

No knowledge components have been assigned

$$\begin{bmatrix} 1 & -3 \\ 3 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 12 \\ 18 \end{bmatrix}$$

The matrix equation above represents which system of equations?
Answers: (Interface Type: RADIO_BUTTON)
✔ **A. x - 3y = 12**

3x + y = 18

✘ B. x + 3y = 12

-3x + y = 18

✘ C. 1 - 3x = 12

3 + y = 18

✘ D. -3x = 12

3y = 18

(Problem ID: 14464) RADIO_BUTTON

No knowledge components have been assigned

Matrices can be a way of simplifying systems of equations._When a system of equations is made into a matrix each row in the matrix corresponds to the coefficents_of the the corresponding equation, so the first row of the matrix corresponds to the coefficients in the first equation and the 2nd row, the coefficients in the 2nd equation. In addition, the columns represent the variables, so the first column would represent the first variabl, x, and the second column would be y. Knowing this, which of the choices is the correct one?
Answers: (Interface Type: RADIO_BUTTON)
✔ **A. x - 3y = 12**

3x + y = 18

✘ B. x + 3y = 12

-3x + y = 18

: This answer is very close to the correct form, however the first column should corresponds to x, and the second to y, and in this answer the first row corresponds to x coefficients and the

second row corresponds to y coefficients. This is not correct matrix form.

✗ C. 1 - 3x = 12

3 + y = 18

This answer looks tricky because it looks very similar to the way matrix form looks. However, every coefficient in the matrix should have an associated variable. This is incorrect

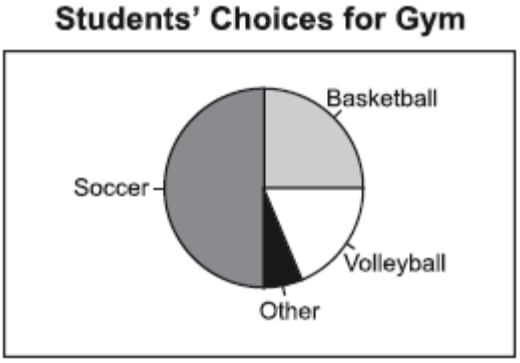
✗ D. -3x = 12

3y = 18

This answer is incorrect because it does not use the "1" coefficients of the matrix, although it properly distributes the variables to the 3 and -3, the 1s are not just place holders.

34.) "2000_28_10 (2006/10/31 10:09:37)" (Problem ID: 14465) RADIO_BUTTON [MA - 2000 - Spring - 28]

No knowledge components have been assigned



Based on the the graph above, which is the best estimate of the percent of the students choosing volleyball?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 10%
✗ B. 30%
✓ **C. 20%**
✗ D. 80%

(Problem ID: 14466) TEXT_FIELD [MA - 2000 - Spring - 28]

No knowledge components have been assigned

As can be seen in the chart, **volleyball** and **other** take up one quarter of the pie. What percentage do **volleyball** and **other** represent?

Answers: (Interface Type: TEXT_FIELD)

✓ **25**

Hint 1:
What percentage is one quarter of the whole?
Hint 2:
1/4 is .25, or 25% of the whole. So **volleyball** and **other** take up 25% of the chart. Enter 25.

(Problem ID: 14467) RADIO_BUTTON [MA - 2000 - Spring - 28]

No knowledge components have been assigned

So, we know that **volleyball** is less than 25% of the whole. Which of the original values is it closest to?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 10%
✗ B. 30%
✓ **C. 20%**
✗ D. 80%

Hint 1:
Other only takes up a little bit of the quarter that both **volleyball** and **other** occupy. Choose one of the original values that is only a little bit less than 25%

Hint 2:
20% is a little bit less than 25%. 10%, though less than 25% is quite a bit smaller than 25%, in fact, less than half its value, and **volleyball** is clearly more than half of the quarter it is in. So 20% is the best answer. Choose C, 20%.

35.) "2000_29_10(2006/10/31 10:16:16)" (Problem ID: 14468) RADIO_BUTTON [MA - 2005 - SPRING - 9]

No knowledge components have been assigned

An article is on sale for 20% off its original price. What percent of increase is needed to return the sale item to its original price?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 50%
✓ **B. 25%**
✗ C. 20%
✗ D. 75%

(Problem ID: 14469) TEXT_FIELD [MA - 2005 - SPRING - 9]

No knowledge components have been assigned

A good way to begin this problem would be to assume a value for the price of the item, a great value to use when dealing with percentages is 100. So using 100 as our price for the article on sale, what is the new value after 20% has been marked off?

Answers: (Interface Type: TEXT_FIELD)

✓ **80**

Hint 1:
20% of 100 is 20. But we want the amount that 100 is after that is removed.

Hint 2:
We subtract 20 from 100 because the 20 is 20% of its price and we want the new price after that is removed. So subtract 20 from 100

Hint 3:
100-20 = 80, enter 80

(Problem ID: 14470) RADIO_BUTTON [MA - 2005 - SPRING - 9]

No knowledge components have been assigned

If the new value is 80, what percentage of 80 is needed in order to get back 100.

Answers: (Interface Type: RADIO_BUTTON)

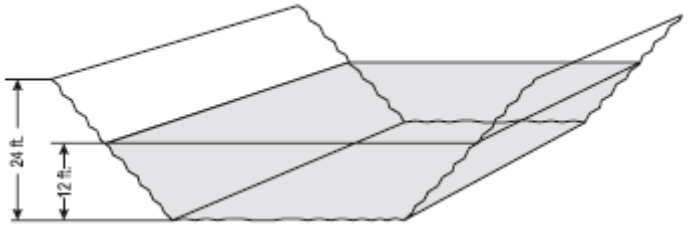
✗ A. 50%
✓ **B. 25%**

✗ C. 20%
✗ D. 75%

Hint 1:
We know we need 20 more to get back to 100, what percentage of 80 is 20?
Hint 2:
Dividing the part, 20, over the whole, 80, will give us a percentage.
Hint 3:
20/80 is 1/4 or .25, multiply that by 100% to give us 25%. Choose 25% because it is the percentage of 80 that needs to be added to get back 100.

36.) "2000_4_10 (2006/11/19 19:45:08)" (Problem ID: 14949) RADIO_BUTTON

No knowledge components have been assigned



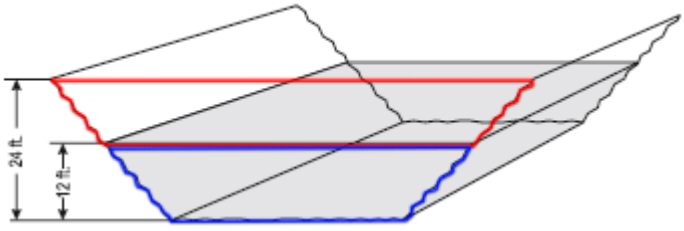
A canal is 24 feet deep and has slanted sides as shown in the cross section of the canal below above. The water level is at 12 feet now. How does the amount of water in the canal now compare to the amount of water in the canal when it is full?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. It is more than half as much
✗ B. It is half as much
✓ **C. It is less than half as much**
✗ D. It is twice as much

(Problem ID: 14950) RADIO_BUTTON

No knowledge components have been assigned

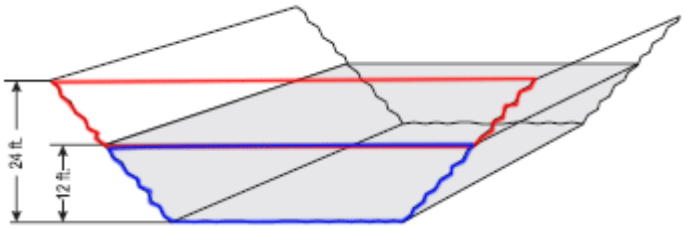


This problem can be misleading because the height of the full canal is twice as high as the initial height, making us think that it is half full, but it is not. Which of the two trapezoids, the the top part of the canal (in red) or the partially full canal (in blue), is larger, in area?

Answers: (Interface Type: RADIO_BUTTON)

✗ Partially full canal (blue)
✓ **Top of canal (red)**

Hint 1:



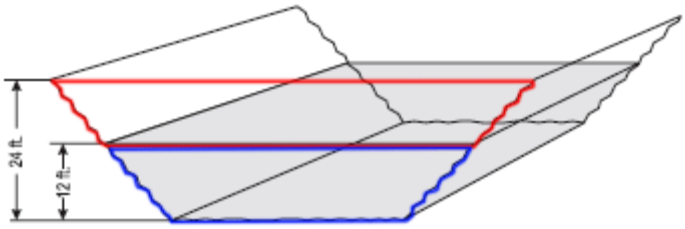
Watch this animation which compares the size of the upper, empty portion of the canal to the lower, full portion of the canal.

Hint 2:

As you can see, the lower portion of the canal, although the same height as the lower portion, is smaller than the upper portion. Choose Full canal (red) because the red outline is larger.

(Problem ID: 14951) RADIO_BUTTON

No knowledge components have been assigned



Now that we can see that the bottom portion isn't the same size as the upper portion of the canal, let's go back to the original question. How does the amount of water in the canal to start with (blue) compare to the amount of water in the canal when it is full (blue + red)?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. It is more than half as much

✗ B. It is half as much

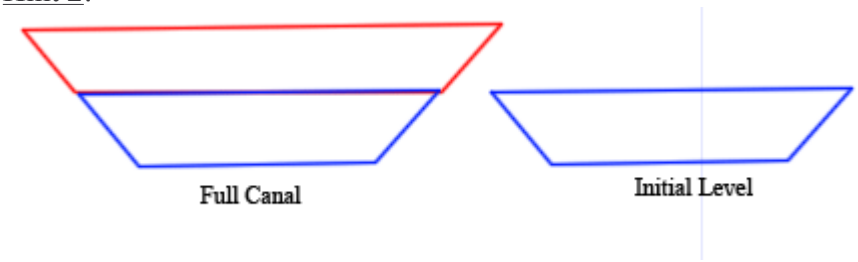
✓ **C. It is less than half as much**

✗ D. It is twice as much

Hint 1:

Remember, we are comparing how big blue is in comparison to red *and* blue.

Hint 2:



Because blue is smaller than red, blue will be less than half the size of red and blue together.

Hint 3:

Choose C, the initial amount of water is less than half as much because the amount needed to fill it is larger than that initial amount.

Module Name: 10thGradeCT-ALL

Questions Only Answer Key Printout for Students **Full Details**

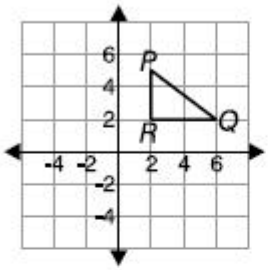
Begin Linear Section

Begin Linear Section

1.) "spring2003-25CT" (Problem ID: 12833) RADIO_BUTTON [MA - 2003 - Spring - 25]

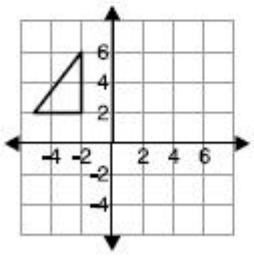
No knowledge components have been assigned

The diagram below shows ΔPQR on a coordinate plane.

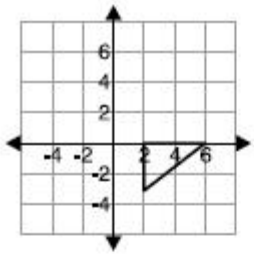


Which of the following is the result of a reflection of ΔPQR?

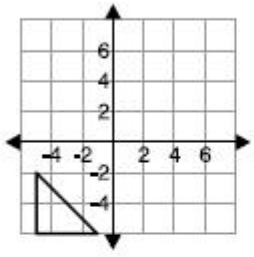
A.



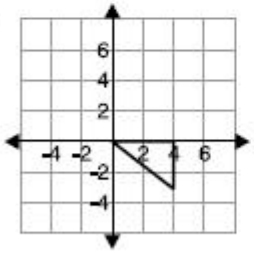
B.



C.



D.



Choose the correct answer.
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✓ **B**
✗ C
✗ D

(Problem ID: 12834) RADIO_BUTTON [MA - 2003 - Spring - 25]

No knowledge components have been assigned

In order to determine which of the choices is the correct one, we have to establish the definition of what reflection is. What do you think reflection is?
Answers: (Interface Type: RADIO_BUTTON)
✗ A 360 degrees rotation around the origin
✗ A swap between the x and y coordinates of each point
✓ **A map that transforms an object into its mirror image**

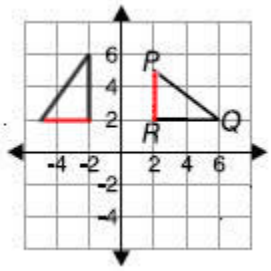
Hint 1:
The answer is a map that transforms an object into its mirror image.

(Problem ID: 12835) RADIO_BUTTON [MA - 2003 - Spring - 25]

No knowledge components have been assigned

Good. Since this is a multiple choice problem, let's look at the choices one at a time. Let's first consider choice A. Is the resulting triangle a mirror image over the Y-axis of the initial triangle?
Answers: (Interface Type: RADIO_BUTTON)
✗ Maybe
✗ Yes *That is not correct. Here is what a reflection over the Y-axis would look like:*
✓ **No**

Hint 1:



A mirror image over the Y-axis would keep the triangle shape and reverse it over Y-axis. In our case, we can see that the sides have been changed - the short red side is vertical on the original figure but horizontal on the other image. Please the figure above
Hint 2:
The correct answer is 'No'. Please select 'No'

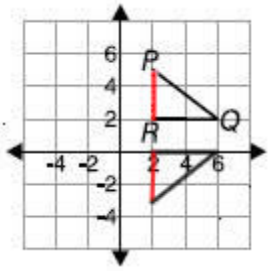
(Problem ID: 12836) RADIO_BUTTON [MA - 2003 - Spring - 25]

No knowledge components have been assigned

Good. Now that you understand what reflection is, let's look at choice B. Is the resulting triangle a mirror image of the initial triangle over the X-axis?
Answers: (Interface Type: RADIO_BUTTON)
✗ No

✓ **Yes**

Hint 1:



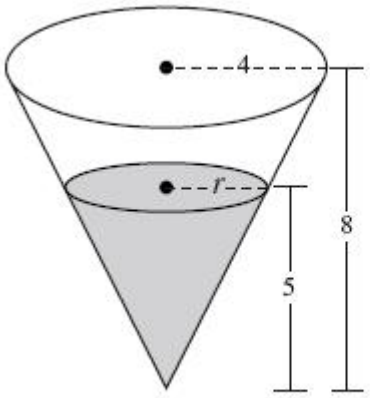
A mirror image over the x-axis would keep the triangle shape and reverse it over the X-axis - in our case, we can see that these requirments are met.

Hint 2:

The correct answer is 'Yes'. Please select 'Yes'

2.) "spring2003-40CT" (Problem ID: 12837) RADIO_BUTTON [MA - 2003 - Spring - 40]

No knowledge components have been assigned



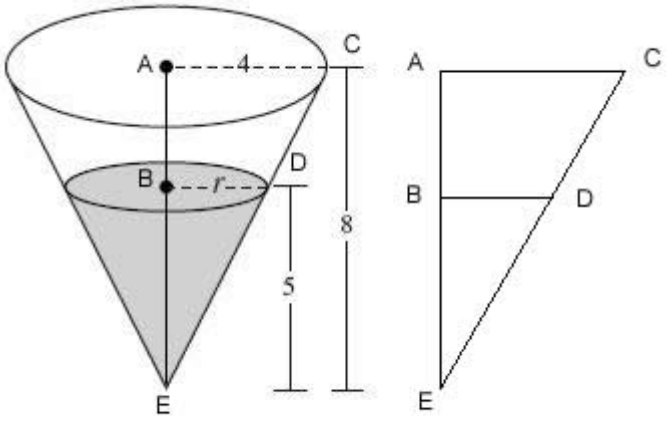
A cup in the shape of a cone has a height of 8 units and a radius of 4 units as shown in the figure below. The water in the cup reaches a height of 5 units. What is the value of r, the radius of the surface of the water?

Answers: (Interface Type: RADIO_BUTTON)

✗ 1.6 units
✗ 10.0 units
✓ **2.5 units**
✗ 6.4 units

(Problem ID: 12847) RADIO_BUTTON [MA - 2003 - Spring - 40]

No knowledge components have been assigned



We will solve this problem by using similar triangles. What are the similar triangles in the figure displayed?

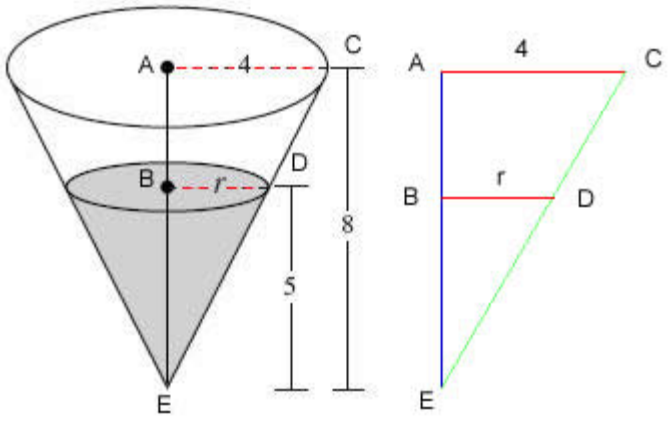
Answers: (Interface Type: RADIO_BUTTON)

✓ **ACE and BDE**

✗ EDC and EBA

✗ ADE and BAE

Hint 1:



See the picture above. As you can see, sides AC and BD are in the same color so they will each be a side in one of the 2 similar triangles.

Hint 2:

The correct answer is 'ACE and BDE'. Please select 'ACE and BDE'

(Problem ID: 12848) RADIO_BUTTON [MA - 2003 - Spring - 40]

No knowledge components have been assigned

Good. We know that for 2 similar triangles the corresponding ratios of the sides are equal. Which of the following equations is true for our 2 triangles?

Answers: (Interface Type: RADIO_BUTTON)

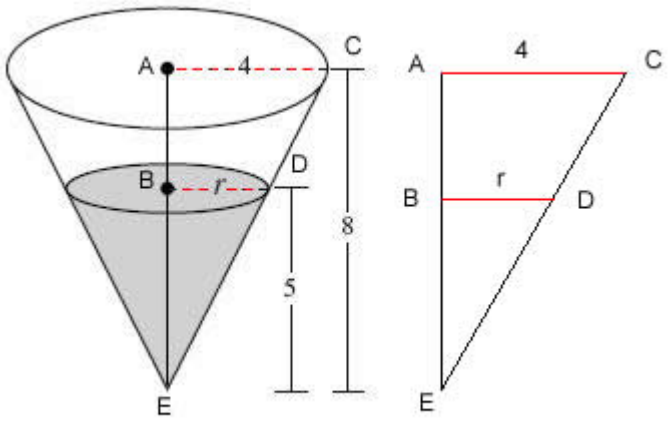
✗ 4 / 5 = r / 8

✗ 8 / 4 = r / 5

✗ r / 4 = 5 / 8

✓ **r / 5 = 4 / 8**

Hint 1:



Note that the 2 radii are related to each other, so they need to be in the same position in the proportion.

Hint 2:

So we have radius / height for each triangle. This gives 4 / (height large triangle) = r / (height small triangle)

Hint 3:

The heigth corresponding to the larger triangle is 8. The height corresponding to the smaller triangle is 5. Substitute these values in the equation above.

Hint 4:

The correct answer is 'r / 5 = 4 / 8'. Please select 'r / 5 = 4 / 8'

(Problem ID: 13509) TEXT_FIELD [MA - 2003 - Spring - 40]

No knowledge components have been assigned

Good. Now that we have the equation r /5 = 4 / 8, what is the value of r?

Answers: (Interface Type: TEXT_FIELD)

✔ **2.5**

Hint 1:

$$\frac{r}{5}=\frac{4}{8}$$

$$5(\frac{r}{5})=5(\frac{4}{8})$$

$$r=\frac{4}{8}\times\frac{5}{1}$$

Multiply both sides by 5 to isolate r - see the equation above

Hint 2:

$$r=\frac{4\times5}{8}=\frac{20}{8}$$

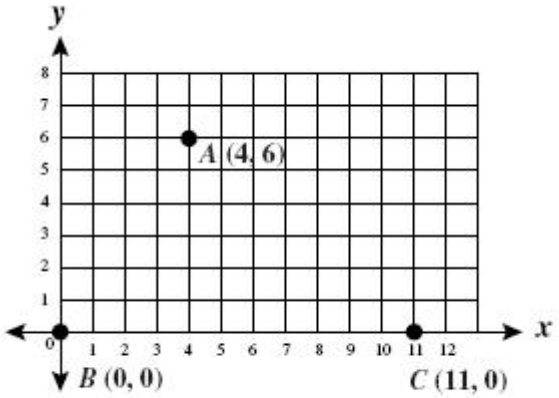
Solve the above to get r.

Hint 3:

The correct answer is 2.5. Please enter 2.5.

3.) "autumn2003-3CT" (Problem ID: 12854) RADIO_BUTTON [MA - 2003 - NOV - 3]

No knowledge components have been assigned



The coordinates for three vertices of the trapezoid ABCD are: A (4, 6), B (0, 0) and C (11, 0). The area of the trapezoid is 48 square units. Which of the following could be the coordinates of point D?

Answers: (Interface Type: RADIO_BUTTON)

✗ (11, 5)
✗ (11,6)
✗ (5,6)
✓ **(9,6)**

(Problem ID: 12855) TEXT_FIELD [MA - 2003 - NOV - 3]

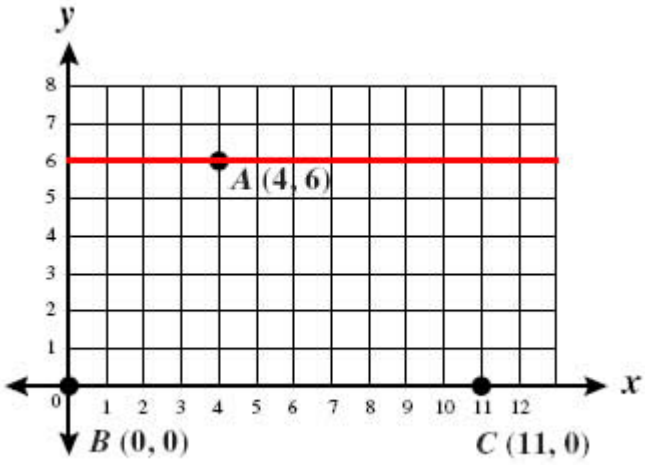
No knowledge components have been assigned

First we need to get an idea of where point D should go. Then we can use the formula for the area of a trapezoid to determine the length of AD and the coordinated of point D. What is the y-coordinate of the point D?

Answers: (Interface Type: TEXT_FIELD)

✓ **6**

Hint 1:

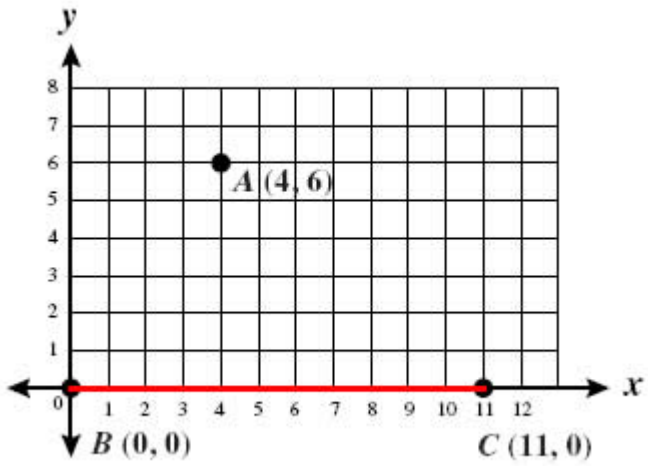


Since ABCD is a trapezoid, segment AD must be parallel to segment BC. So it must be on

the red line in the picture above.
Hint 2:
The Y-coordinate of A is 6, therefore point D is the same distance up from the X axis
Hint 3:
The correct answer is '6'. Please enter '6' (without quotes).

(Problem ID: 12856) TEXT_FIELD [MA - 2003 - NOV - 3]

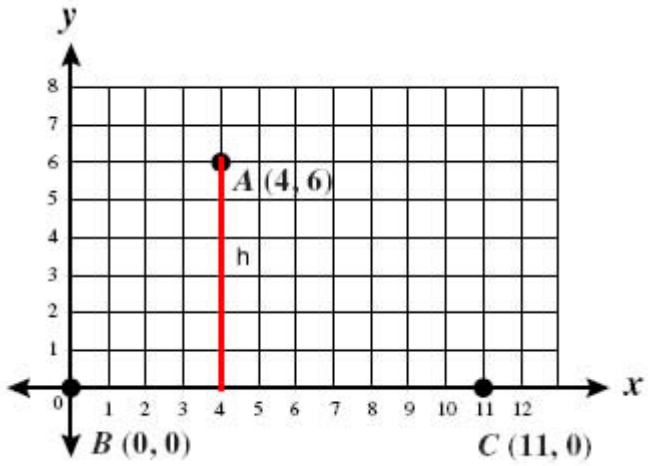
No knowledge components have been assigned
Good. We know that the area of the trapezoid in our case is (AD + BC) * height / 2. We can find the length of BC and the height in order to determine the length of AD. What is the length of the segment BC?
Answers: (Interface Type: TEXT_FIELD)
✓ **11**
Hint 1:



The y-coordinates of points B and C are 0. Therefore, you should only look at the x-coordinates when finding the length.
Hint 2:
The length of the segment BC is the x-coordinate of point C (11) minus the x-coordinate of point B (0)
Hint 3:
The length of the segment BC is 11 - 0 = 11. The correct answer is '11'. Please enter '11' (without quotes).

(Problem ID: 12857) TEXT_FIELD [MA - 2003 - NOV - 3]

No knowledge components have been assigned
Great. Now, what is the length of the height h of the ABCD trapezoid?
Answers: (Interface Type: TEXT_FIELD)
✓ **6**
Hint 1:



The height of the trapezoid is the segment originating in point A that is perpendicular to segment BC.

Hint 2:

The y-coordinate of A is 6 while the base of the height will have a y-coordinate of 0.

Hint 3:

The correct answer is '6'. Please enter '6' (without quotes).

(Problem ID: 12858) TEXT_FIELD [MA - 2003 - NOV - 3]

No knowledge components have been assigned

Correct. Next, we will use the formula for the area of a trapezoid in order to find the length of the segment AD. You can find this in the formula sheet provided tou you. What is the length of the segment AD?

Answers: (Interface Type: TEXT_FIELD)

✔ **5**

Hint 1:

The area of the trapezoid is (AD + BC) * height / 2 and is equal to 48 units.

Hint 2:

$$Area = \frac{(AD + BC) \times h}{2}$$

$$48 = \frac{(AD + 11) \times 6}{2}$$

$$2 \times 48 = (AD + 11) \times 6$$

$$96 = 6AD + 66$$

$$96 - 66 = 6AD + 66 - 66$$

$$30 = 6AD$$

$$\frac{30}{6} = \frac{6AD}{6}$$

$$5 = AD$$

Look to see the way in which the equation is solved and then enter the answer

Hint 3:

The correct answer is '5'. Please enter '5' (without quotes).

(Problem ID: 12860) TEXT_FIELD [MA - 2003 - NOV - 3]

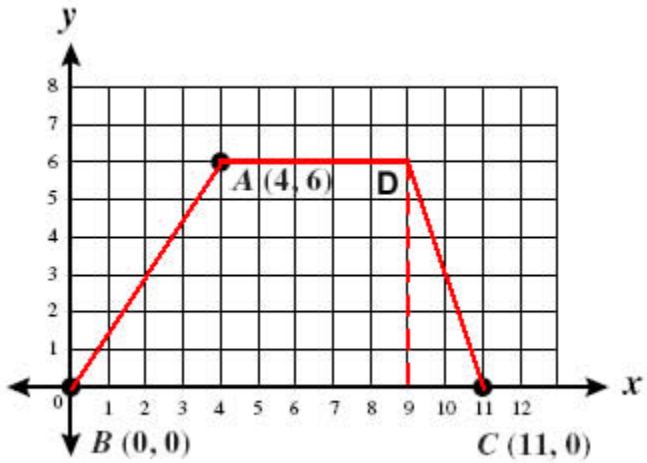
No knowledge components have been assigned

Good. So what is the x-coordinate of point D?

Answers: (Interface Type: TEXT_FIELD)

✓ **9**

Hint 1:



The x-coordinate of point A is 4 and the length of the segment AD is 5

Hint 2:

The x-coordinate of the point D is 4 + 5.

Hint 3:

The correct answer is '9'. Please enter '9' (without quotes).

4.) "autumn2003-38CT" (Problem ID: 12879) RADIO_BUTTON [MA - 2003 - NOV - 38]

No knowledge components have been assigned

What is the midpoint of a line segment with endpoints at (-3.5, -2.1) and (5.7, 3.3)?

Answers: (Interface Type: RADIO_BUTTON)

✓ **(1.1, 0.6)**

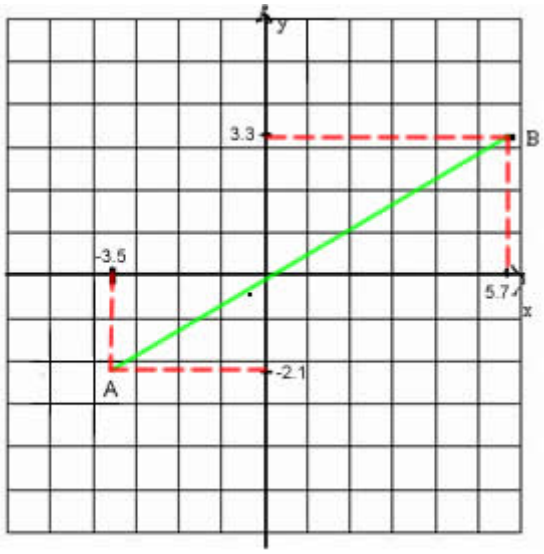
✗ (1.1, 2.7)

✗ (2.2, 1.2)

✗ (-3.5, 3.3)

(Problem ID: 12880) TEXT_FIELD [MA - 2003 - NOV - 38]

No knowledge components have been assigned



Let A be the point (-3.5, -2.1) and B the point (5.7, 3,3) - see the figure above. Let's start by finding the x-coordinate of the midpoint of the segment AB? What is the x-coordinate of the midpoint of the segment AB?

Answers: (Interface Type: TEXT_FIELD)

✓ **1.1**

Hint 1:
The x-coordinate always comes before the y-coordinate.
Hint 2:
The x-coordinate of the midpoint is the sum of the x-coordinates of the end points divided by 2.
Hint 3:
The answer is the result produced by (-3.5 + 5.7) /2 .
Hint 4:
The correct answer is '1.1'. Please enter '1.1' (without quotes).

(Problem ID: 12881) RADIO_BUTTON [MA - 2003 - NOV - 38]

No knowledge components have been assigned

Good. We now have the x-coordinate of the midpoint. We want to also find the y-coordinate. What is the y-coordinate of the midpoint of segment AB?

Answers: (Interface Type: RADIO_BUTTON)

✗ 0.5
✓ **0.6**
✗ 0.8
✗ 1.1

Hint 1:
The y-coordinate always comes after the x-coordinate
Hint 2:
The y-coordinate of the midpoint is the sum of the y-coordinates of the end points divided by 2.
Hint 3:
The answer is the result produced by (-2.1 + 3.3) /2 .
Hint 4:
The correct answer is '0.6'. Please select '0.6'.

(Problem ID: 12882) RADIO_BUTTON [MA - 2003 - NOV - 38]

No knowledge components have been assigned

Correct. What is the midpoint of the segment AB?

Answers: (Interface Type: RADIO_BUTTON)

✗ (2.2, 1.2)
✗ (1.1, 2.7)
✗ (-3.5, 3.3)
✓ **(1.1, 0.6)**

Hint 1:
Review the previous questions where you found both the x and the y coordinates of this segment

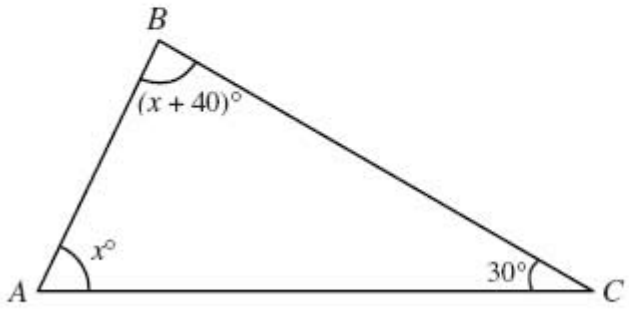
Hint 2:
The correct answer is '(1.1, 0.6)'. Please select '(1.1, 0.6)'.

5.) "autumn2003-16" (Problem ID: 13571) TEXT_FIELD [MA - 2002 - Spring - 21]

No knowledge components have been assigned

Degree measures for the angles in ΔABC are given below.

- $m\angle A = x°$
- $m\angle B = (x + 40)°$
- $m\angle C = 30°$



What is the degree measure of $\angle A$ in ΔABC?

Please choose the correct answer in degrees:

Answers: (Interface Type: TEXT_FIELD)

✓ **55**

(Problem ID: 13572) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned

To solve this problem we will use the property of the sum of the angles in a triangle in order to determine x. What is the property of the sum of the measurements of the angles in a triangle?

Answers: (Interface Type: RADIO_BUTTON)

✗ The sum of the angles is 270 degrees

✓ **The sum of the angles is 180 degrees**
✗ The sum of the angles is 90 degrees
✗ The sum of the angles is 360 degrees

Hint 1:
In any triangle the sum of the angles is 180 degrees
Hint 2:
The correct answer is 'The sum of the angles is 180 degrees'. Please select 'The sum of the angles is 180 degrees'

(Problem ID: 13573) TEXT_FIELD [MA - 2002 - Spring - 21]

No knowledge components have been assigned
Good. You can now use algebra to find x. What is the value of x in degrees?
Answers: (Interface Type: TEXT_FIELD)
✓ **55**

Hint 1:
The sum of the values of all the angles in the triangle are equal to 180 degrees. In other words, A + B + C = 180?
Hint 2:
So we can use the information inthe diagram to write: x + (x + 40) + 30 = 180?. Find x in this equation
Hint 3:

$$x+(x+40)+30=180$$

$$2x+40+30=180$$

$$2x+70=180$$

$$2x+70-70=180-70$$

$$2x=110$$

$$\frac{2x}{2}=\frac{110}{2}$$

$$x=\frac{110}{2}$$

Review the steps to get the solution of the equation and then simplify to get x.
Hint 4:
110 / 2 = 55. So the correct answer is '55'. Please enter '55' (without quotes).

(Problem ID: 13574) TEXT_FIELD [MA - 2002 - Spring - 21]

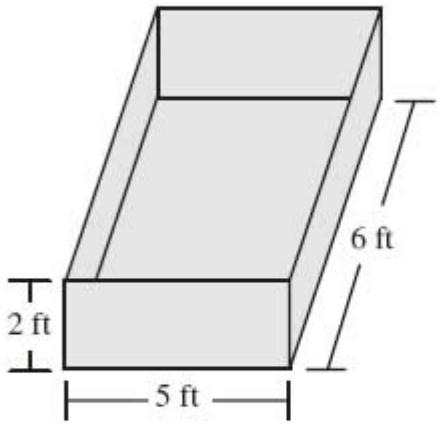
No knowledge components have been assigned
What is the measurement of angle A in degrees?
Answers: (Interface Type: TEXT_FIELD)
✓ **55**

Hint 1:
The measure of angle A is equal to the value of x that you found before.
Hint 2:
The correct answer is '55'. Please enter/select '55' (without quotes).

6.) "autumn2003-29" (Problem ID: 13590) RADIO_BUTTON

No knowledge components have been assigned

Mike plans to use bags containing 1.5 cubic feet of sand to fill a 5-foot by 6-foot by 2-foot sandbox in the shape of a rectangular prism as shown below.



What is the least number of bags needed to completely fill the sandbox?

A. 40 bags of sand

B. 45 bags of sand

C. 60 bags of sand

D. 90 bags of sand

Please choose the right answer:

Answers: (Interface Type: RADIO_BUTTON)

✓ **A**

✗ B

✗ C

✗ D

(Problem ID: 13591) TEXT_FIELD

No knowledge components have been assigned

We will determine the volume of the box and the ratio between the volume of the bag and the volume of the box, in order to find out how many bags are needed. How many cubic feet is the volume of the box?

Answers: (Interface Type: TEXT_FIELD)

✓ **60**

Hint 1:

The volume of the box is the width times the length times the height of the box
Hint 2:
The volume of the box is equal to 2 * 5 * 6
Hint 3:
The correct answer is '60'. Please enter/select '60' (without quotes).

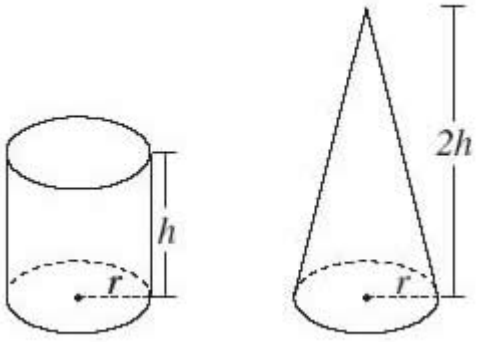
(Problem ID: 13593) TEXT_FIELD

No knowledge components have been assigned
What is the least number of bags needed to completely fill the sandbox?
Answers: (Interface Type: TEXT_FIELD)
✓ **40**

Hint 1:
The volume of the box is 60, while the volume of a bag is 1.5. If you divide the volume of the box to the volume of a bag you will find the number of bags needed to fill a box.
Hint 2:
V of box / V of sand bag = 60 / 1.5. Simplify this fraction to obtain the answer
Hint 3:
The correct answer is '40'. Please enter '40' (without quotes).

7.) "autumn2003-9" (Problem ID: 13667) RADIO_BUTTON

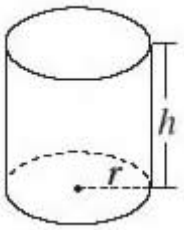
No knowledge components have been assigned



The cylinder and the cone shown above have the same radius, r . The height of the cone is twice the height, h , of the cylinder. What is the ratio of the volume of the cylinder to the volume of the cone?
Answers: (Interface Type: RADIO_BUTTON)
✗ 2:1
✗ 2:2
✗ 3:1
✓ **3:2**

(Problem ID: 13668) RADIO_BUTTON

No knowledge components have been assigned



We will now find the volume of the cylinder and the volume of the cone and then write their ratio and simplify it. What is the formula for the volume of a cylinder with radius r and height h?

Answers: (Interface Type: RADIO_BUTTON)

✗ $(4/3)\pi r^2h$

✓ **πr^2h**

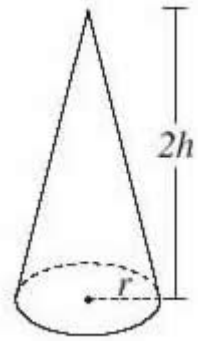
✗ $(4/3)\pi r^3$

✗ $(1/3)\pi r^2h$

Hint 1:
You can look at your reference sheet to find this formula.
Hint 2:
The formula for the volume of a cylinder with radius r and height h is πr?h.
The answer is πr?h.

(Problem ID: 13669) RADIO_BUTTON

No knowledge components have been assigned



Correct. What is the formula for the volume of a cone with radius r and height h?

Answers: (Interface Type: RADIO_BUTTON)

✓ **(1/3)πr?h**

✗ (4/3)πr?h

✗ πr?h

✗ $(4/3)\pi r^3$

Hint 1:
You can look at your reference sheet to find this formula.
Hint 2:
The formula for the volume of a cone with radius r and height h is (1/3)πr?h.
The answer is (1/3)πr?h.

(Problem ID: 13670) RADIO_BUTTON

No knowledge components have been assigned

Good. So we found the volume of the cone. As we can see, in our picture the height of the cone is **2h** . What is the volume of the cone in the picture?

Answers: (Interface Type: RADIO_BUTTON)

✓ **(2/3)πr?h**

✗ (2h/3)πr?h

✗ (4/3)πr?h

✗ 2πr?h

Hint 1:

We have to put 2h instead of h in the formula for the volume of a cone.

Hint 2:

We get (1/3)πr?2h. Multiply the term 1 / 3 by 2 to simplify the expression and get our answer.

Hint 3:

(1/3)πr?2h = (2/3)πr?h. The correct answer is (2/3)πr?h.

(Problem ID: 13671) RADIO_BUTTON

No knowledge components have been assigned

Great. So what is the ratio between the volume of the cylinder and the volume of the cone?

Answers: (Interface Type: RADIO_BUTTON)

✗ 3:1

✗ 2:1

✗ 2:2

✓ **3:2**

Hint 1:

$$\frac{\pi r^2 h}{\frac{2}{3}\pi r^2 h}$$

Simplify the ratio above to get the answer.

Hint 2:

The term πr?h is the same for both the numerator and denominator so you can replace πr?h / πr?h with 1.

Hint 3:

$$\frac{1}{\frac{2}{3}}$$

Simplify the fraction above to get the answer.

Hint 4:

$$\frac{1}{\frac{2}{3}} = \frac{1 \times \frac{3}{2}}{\frac{2}{3} \times \frac{3}{2}} = \frac{\frac{3}{2}}{1} = \frac{3}{2}$$

Please review the way in which the equation was solved - we multiplied the numerator and denominator by 3 / 2 in order to simplify the fraction.

Hint 5:

As can be seen above, the ratio is 3/2 or 3:2. The answer is 3:2.

8.) "autumn2003-40" (Problem ID: 13679) RADIO_BUTTON

No knowledge components have been assigned

The Fancy Marble Company makes one type of spherical marble with a radius of 2 cm. The maximum error in measurement is 0.1 cm for the radius. Which of the following is closest to the minimum volume of one of these marbles?

A. $7.95\ cm^3$

B. $8.79\ cm^3$

C. $28.72\ cm^3$

D. $38.77\ cm^3$

Please choose the correct answer:

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

(Problem ID: 13680) RADIO_BUTTON

No knowledge components have been assigned

What is the minimum radius that a marble can have in cm?

Answers: (Interface Type: RADIO_BUTTON)

✗ 1.8
✓ **1.9**
✗ 2.1
✗ 2.0

Hint 1:
The length of the radius is 2 cm ? error.
Hint 2:
The minimum radius is 2 cm – 0.1 cm.
Hint 3:
The correct answer is 1.9. Please select 1.9.

(Problem ID: 13681) RADIO_BUTTON

No knowledge components have been assigned

Good. What is the volume of a sphere of radius r?

Answers: (Interface Type: RADIO_BUTTON)

✓ **$(4/3)\pi r^3$**
✗ $\pi r^2 h$
✗ $(2/3)\pi r^3$

✗ $(1/3)\pi r^3$

Hint 1:
You can check your formula sheet to find this formula.
Hint 2:
The correct answer is (4/3)πr?. Please select (4/3)πr?.

(Problem ID: 13682) RADIO_BUTTON

No knowledge components have been assigned
Correct. Now which of the following is closest to the minimum volume of one of these marbles?
Answers: (Interface Type: RADIO_BUTTON)
✓ **28.72 cm?**
✗ 38.77 cm?
✗ 7.95 cm?
✗ 8.79 cm?

Hint 1:
Substitute the value 1.9 for the radius in the formula (4/3)πr? and simplify.
Hint 2:
Simplify the following to get the answer: π(4/3)(1.9)? = 3.14*(1.333)*(6.86).
Hint 3:
The answer to the expression above is 28.64. The answer is the choice that this value is closest to.
Hint 4:
The correct answer is 28.72 cm?. Please select 28.72 cm?.

9.) "autumn2003-7" (Problem ID: 13691) RADIO_BUTTON [MA - 2003 - Spring - 20]

No knowledge components have been assigned
Which of the following measures is closest to the radius of a circle with circumference 132 centimeters?
Answers: (Interface Type: RADIO_BUTTON)
✗ 44 cm
✗ 13 cm
✗ 42 cm
✓ **21 cm**

(Problem ID: 13692) RADIO_BUTTON [MA - 2003 - Spring - 20]

No knowledge components have been assigned
We will need the formula for the circumference of a circle in order to determine the measure of the radius. Let r be the radius of the circle. What is the circumference of the circle in terms of a constant, π and r ?
Answers: (Interface Type: RADIO_BUTTON)
✗ πr? *This is not correct, it is the formula for the area of the circle, not for the circumference*
✗ r?
✗ πr? *This is not correct, it is the formula for the area of the circle, not for the circumference*
✓ **2πr**

Hint 1:

You can look at your reference sheet in order to find this formula.
Hint 2:
The correct answer is 2πr. Please select 2πr.

(Problem ID: 13693) RADIO_BUTTON [MA - 2003 - Spring - 20]

No knowledge components have been assigned

Good. Which of the following measures is closest to the radius of a circle with circumference 132 centimeters? (You can approximate π to roughly 3).

Answers: (Interface Type: RADIO_BUTTON)

✗ 13 cm
✓ **21 cm**
✗ 42 cm
✗ 44 cm

Hint 1:
Make an equation setting 2πr equal to 132 and then solve for r to get the answer.
Hint 2:

$$2\pi r = 132$$

$$\frac{2\pi r}{2\pi} = \frac{132}{2\pi}$$

$$r = \frac{132}{2\pi}$$

Please review the solution to the equation.
Hint 3:
The closest approximation is 21 cm. Please select 21 cm.

10.) "autumn2003-34" (Problem ID: 13726) RADIO_BUTTON

No knowledge components have been assigned

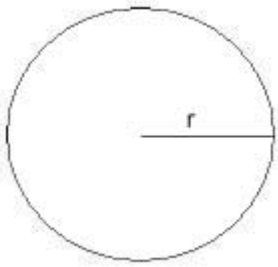
Jarod uses the meter wheel to measure the distance, in meters, along the ground. One complete revolution of the meter wheel measures exactly 1 meter along the ground. What is the radius of the meter wheel?

Answers: (Interface Type: RADIO_BUTTON)

✗ (π / 2)m
✗ (1 / π)m
✗ (2 / π)m
✓ **(1 / 2π)m**

(Problem ID: 13727) RADIO_BUTTON

No knowledge components have been assigned



We are given a circle, we know its circumference and we want to find the radius. What is the formula for the circumference of a circle in terms of radius *r* ?

Answers: (Interface Type: RADIO_BUTTON)

✗ r?
✗ πr? *No, this is the formula of the **area** , not of the **circumference***
✓ **2πr**
✗ πr? *No, this is the formula of the **area** , not of the **circumference***

Hint 1:
You can look at your reference sheet in order to find this formula.
Hint 2:
The formula for the circumference of a circle in terms of radius *r* is 2πr. The correct answer is 2πr.

(Problem ID: 13728) RADIO_BUTTON

No knowledge components have been assigned

Good. Now use the formula for the circumference determined above in order to to find the radius if the circumference is equal to 1.

Answers: (Interface Type: RADIO_BUTTON)

✗ (π / 2) m
✗ (1 / π) m
✓ **(1 / 2π) m**
✗ (2 / π) m

Hint 1:
Substitute 1 for C in the equation C = 2πr and solve for r.
Hint 2:
Solve the equation 2πr = 1.
Hint 3:
Divide both sides by 2π to obtain the answer.
Hint 4:

$$2\pi r = 1$$

$$\frac{2\pi r}{2\pi} = \frac{1}{2\pi}$$

$$r = \frac{1}{2\pi}$$

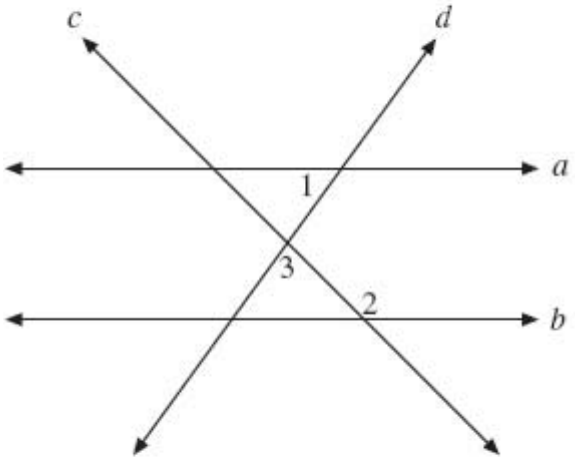
Please review the solution to the equation.
Hint 5:
As we can see above, the correct answer for the radius is (1 / 2π) m.

11.) "autumn2003-10" (Problem ID: 13987) RADIO_BUTTON [MA - 2000 - Spring - 5]

No knowledge components have been assigned

The diagram below has the following properties:

- Line a is parallel to line b.
- $m\angle 1 = 62°$
- $m\angle 2 = 122°$



What is $m\angle 3$?

A. 56°

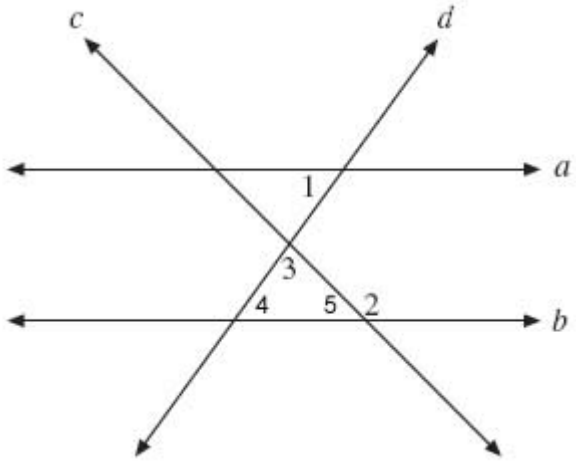
B. 58°

C. 60°

D. 62°

Please choose the correct answer:
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✓ **C**
✗ D

(Problem ID: 13988) TEXT_FIELD [MA - 2000 - Spring - 5]
No knowledge components have been assigned

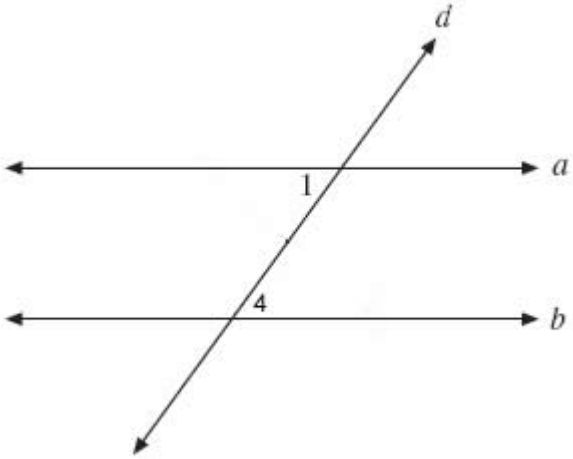


Note that angle <3 is part of a triangle with <4 and <5. If we can find the measurment of angles <4 and <5, then we can also find the measure of <3. How many degrees is m <4?

Answers: (Interface Type: TEXT_FIELD)

✓ **62**

Hint 1:



Look at the picture above. Note that lines a and b are parallel and d is a secant that crosses both lines. Therefore, <1 and <4 are alternate interior angles and should have the same measure.

Hint 2:

m <1 = m <4. We know that m <1 = 62?

Hint 3:

The correct answer is 62. Please enter 62.

(Problem ID: 13993) TEXT_FIELD [MA - 2000 - Spring - 5]

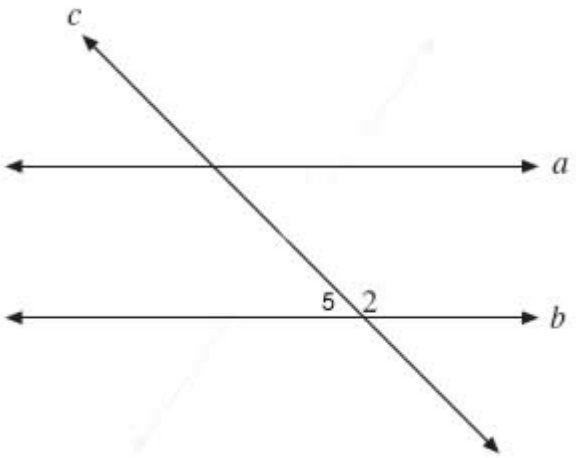
No knowledge components have been assigned

Good. Now, how many degrees is m <5?

Answers: (Interface Type: TEXT_FIELD)

✓ **58**

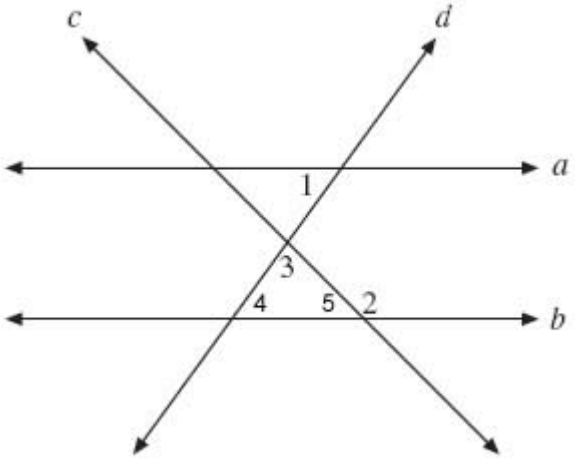
Hint 1:



Look at the picture above. Notice that <5 and <2 are supplementary angles, therefore their sum should equal 180?.
Hint 2:
m <5 + m <2 = 180?. We know that m <2 = 122?. Therefore, m <5 + 122? = 180?.
Hint 3:
m <5 = 180? - 122? = 58?. Therefore, the correct answer is 58. Please enter 58.

(Problem ID: 13994) RADIO_BUTTON [MA - 2000 - Spring - 5]

No knowledge components have been assigned



Correct. Now, you know the measures of angles <4 and <5 and they form a triangle with <3. So what it m<3?

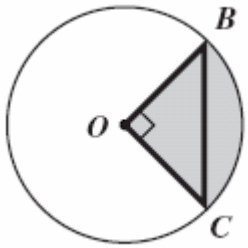
Answers: (Interface Type: RADIO_BUTTON)

✗ 56°
✗ 62°
✓ **60°**
✗ 58°

Hint 1:
The sum of the angles in a triangle is equal to 180?. So solve the equation m<3 + m<4 + m<5 = 180?.
Hint 2:
m<3 + 62? + 58? = 180?. So m<3 = 180? - 62? - 58?.
Hint 3:
The correct answer is 60?. Please select 60?.

12.) "autumn2003-6" (Problem ID: 13995) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned



The radius of circle O shown above is 8 units. The area of the shaded region is 1 / 4 the area of the circle. What is the length of chord BC?

Answers: (Interface Type: RADIO_BUTTON)

✗ 4√2 units

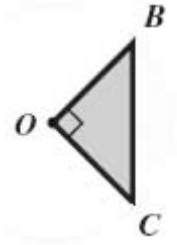
✗ 8

✓ **8√2 units**

✗ 8√3 units

(Problem ID: 13996) TEXT_FIELD [MA - 2002 - Spring - 21]

No knowledge components have been assigned



We will now find information about triangle OBC. We already know two of the sides. Now let's think about what else we know about the triangle. What is the measure of the angle between OB and OC, in degrees?

Answers: (Interface Type: TEXT_FIELD)

✓ **90**

Hint 1:
The angle inside the circle O is 360?.

Hint 2:
The area of the shaded region is ? of the area of the circle, therefore the angle between OB and OC is ? of 360?.

Hint 3:
(1 / 4) * 360? = 90?. The correct answer is 90.

(Problem ID: 13997) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned

Good. Now that you know OBC is a right triangle and you have the measures of the lengths, what is the length of chord BC?

Answers: (Interface Type: RADIO_BUTTON)

✗ 4√2 units
✗ 8√3 units
✗ 8 units
✓ **8√2 units**

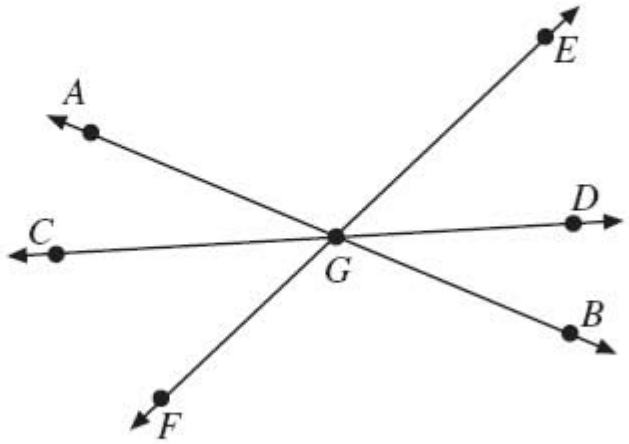
Hint 1:
Both OB and OC are radii in circle O and we know that the radius of the circle is 8 units, therefore OB = OB = 8 units.
Hint 2:
Using the Pythagorean Theorem we get that OB? + OC? = BC?.
Hint 3:
8? + 8? = BC?. Solve the equation to get BC.
Hint 4:
8? + 8? = BC?
64 + 64 = BC?
128 = BC?
What is the value of BC?
Hint 5:
128 = BC?
√128 = BC
8√2 = BC
The answer is 8√2 units.

13.) "autumn2004-16" (Problem ID: 12927) TEXT_FIELD

No knowledge components have been assigned

Coplanar lines $\overleftrightarrow{AB}$, $\overleftrightarrow{CD}$, and $\overleftrightarrow{EF}$ intersect at point G as shown in the figure below.

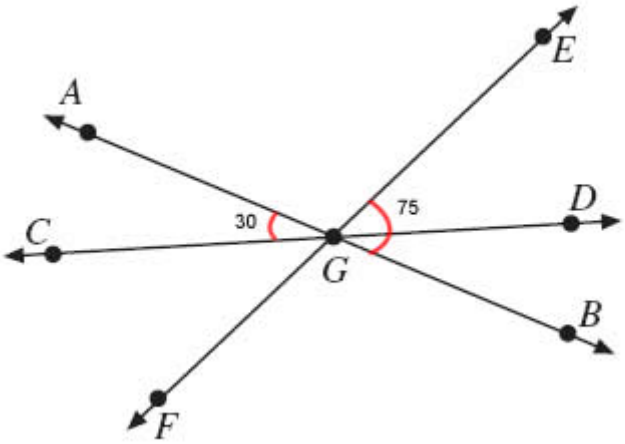
- The measure of $\angle EGB$ is 75°.
- The measure of $\angle AGC$ is 30°.



What is the measure of $\angle EGD$?

Please choose the correct answer:
Answers: (Interface Type: TEXT_FIELD)
✓ **45**

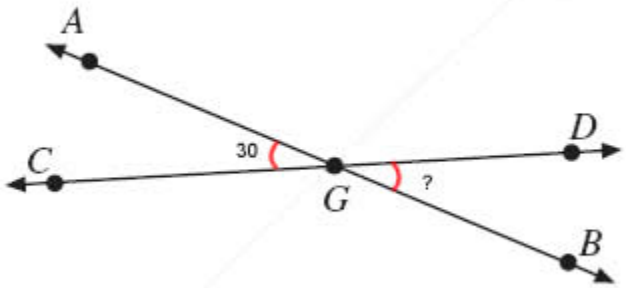
(Problem ID: 12928) TEXT_FIELD
No knowledge components have been assigned



It will help to make a sketch of the picture and label what you already know now. We can use our knowledge of equivalent angles to find the measure of EGD. First, let's find the measure of angle DGB, which will help us find the value of angle EGD. What is the measure of DGB in degrees?
Answers: (Interface Type: TEXT_FIELD)

✓ **30**

Hint 1:



Line AB intersects the line CD in point G, therefore the measure of angle AGC is equal to the measure of angle DGB since they are vertical angles.

Hint 2:

The correct answer is 30. Please enter 30.

(Problem ID: 12929) TEXT_FIELD

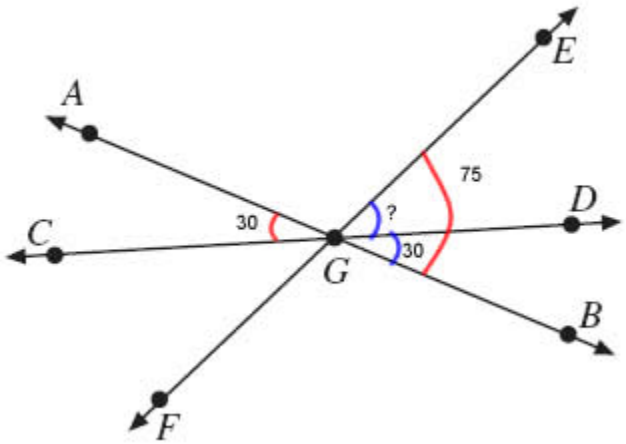
No knowledge components have been assigned

Good. Now label your sketch with our new information. What is the measure of angle EGD?

Answers: (Interface Type: TEXT_FIELD)

✓ **45**

Hint 1:



angle EGD + angle DGB = angle EGB.

Hint 2:

So, EGD + 30 = 75. Solve this equation to find angle EGD.

Hint 3:

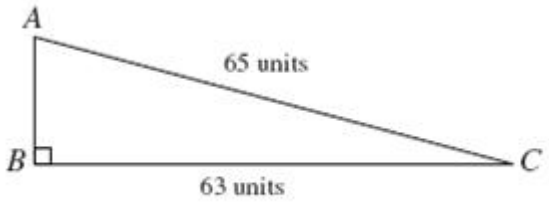
EGD + 30 - 30 = 75 - 30 = 45

Hint 4:

So the correct answer is 45. Please enter 45.

14.) "autumn2004-30" (Problem ID: 13549) RADIO_BUTTON [MA - 2003 - NOVEMBER - 10]

No knowledge components have been assigned



What is the length of the segment AB?

Answers: (Interface Type: RADIO_BUTTON)

✓ **16 units**

✗ 2 units

✗ 64 units

✗ 90.5 units

(Problem ID: 13550) RADIO_BUTTON [MA - 2003 - NOVEMBER - 10]

No knowledge components have been assigned

Since we have a right triangle, we can apply the Pythgorean theorem to this problem. What is the relationship between the lengths of the 3 sides of triangle ABC?

Answers: (Interface Type: RADIO_BUTTON)

✗ AB + BC = AC *This is not correct. Although similar to the correct answer, it does not have the lengths squared. Please try again*

✗ $AB^2 + AC^2 = BC^2$

✓ **$AB^2 + BC^2 = AC^2$**

Hint 1:

In a right triangle the sum of the squares of the sides is equal to the square of the length of the hypothenuse.

Hint 2:

The correct answer is 'C'. Please select 'C'

(Problem ID: 13551) TEXT_FIELD [MA - 2003 - NOVEMBER - 10]

No knowledge components have been assigned

Good. Knowing that, what is the length of AB?

Answers: (Interface Type: TEXT_FIELD)

✓ **16**

Hint 1:

We know that AB? + BC?= AC?. Therefore, in order to find AB you should solve the equation AB? = 65? - 63?

Hint 2:
AB = √65? - 63? = √256 = 16
Hint 3:
The correct answer is '16'. Please enter '16' (without quotes).

15.) "autumn2004-23" (Problem ID: 13557) RADIO_BUTTON [MA - 2001 - Spring - 3]

No knowledge components have been assigned

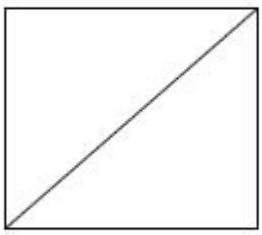
The area of a square is 36 square feet. Which of the following measures is closest to the length of its diagonal in feet?

Answers: (Interface Type: RADIO_BUTTON)

✗ 8.3
✓ **8.5**
✗ 8.7
✗ 8.1

(Problem ID: 13558) TEXT_FIELD [MA - 2001 - Spring - 3]

No knowledge components have been assigned

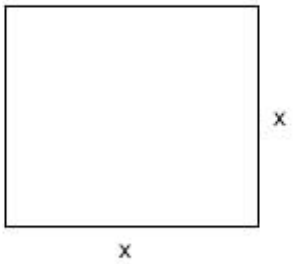


If we can find the length of the sides of the square we can use the Pythagorean theorem to find the length of the diagonal. What is the length of a side of the square?

Answers: (Interface Type: TEXT_FIELD)

✓ **6**

Hint 1:



The area of the square is equal to the length of the side squared. In the figure above, $x^2 = 36$. Solve this equation to find the answer

Hint 2:

What number multiplied by itself equals 36?

Hint 3:

6 * 6 = 36, so 6 is the correct answer. Please enter '6' (without quotes).

(Problem ID: 13566) RADIO_BUTTON [MA - 2001 - Spring - 3]

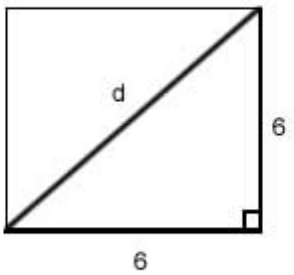
No knowledge components have been assigned

Now that we have the length of the side of the square, what is the length of the diagonal?

Answers: (Interface Type: RADIO_BUTTON)

✗ 8.1
✗ 8.3
✓ **8.5**
✗ 8.7

Hint 1:



The diagonal is also the hypotenuse of the right triangle shown in the figure above.

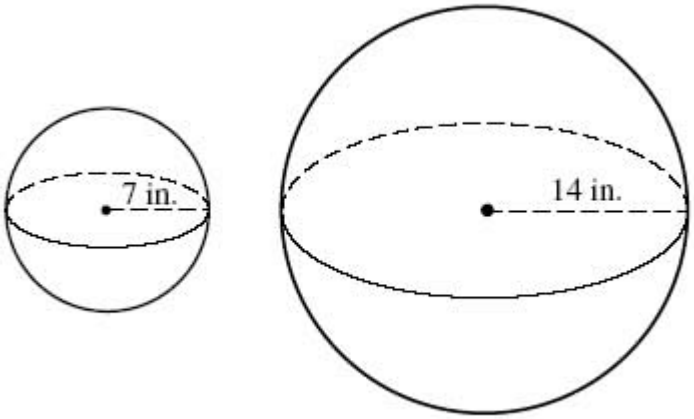
Hint 2:

We know that $a^2 + b^2 = c^2$ for a right triangle, where a and b are the legs and c is the

hypotenuse .
Hint 3:
Solve $6^2 + 6^2 = d^2$, where d is the length of the diagonal.
Hint 4:
$$6^2 + 6^2 = d^2$$
$$36 + 36 = d^2$$
$$72 = d^2$$
$$\sqrt{72} = d$$
Now find d using your calculator.
Hint 5:
The result is 8.46, which is closest to 8.5 in our choices. So the correct answer is '8.5'. Please select 8.5

16.) "autumn2004-28" (Problem ID: 13605) RADIO_BUTTON [MA - 2003 - Spring - 12]

No knowledge components have been assigned



Which of the following is closest to the positive difference in the volumes of the two spheres represented by the drawings above?

Answers: (Interface Type: RADIO_BUTTON)

✗ 25,170 cu. in.
✗ 12,924 cu. in.
✓ **10,052 cu. in.**
✗ 2,401 cu. in.

(Problem ID: 13606) RADIO_BUTTON [MA - 2003 - Spring - 12]

No knowledge components have been assigned

We must determine the volumes of both spheres and then subtract in order to find the difference in the volumes. What is the formula for the volume of a sphere of radius r?

Answers: (Interface Type: RADIO_BUTTON)

✗ $(1/3)\pi r^2 h$
✓ **$(4/3)\pi r^3$**
✗ $\pi r^2 h$

✗ $(4/3)\pi r^2 h$

Hint 1:
You can look at your reference sheet to find this formula.
Hint 2:
The correct answer is (4/3)πr?. Please select (4/3)πr?.

(Problem ID: 13607) TEXT_FIELD [MA - 2003 - Spring - 12]

No knowledge components have been assigned
Good. How many cubic inches is the volume of the sphere of radius 7 in ? Round to the nearest integer (using 3.14 for ;pi;).
Answers: (Interface Type: TEXT_FIELD)
✓ **1436**

Hint 1:
The volume will be equal to (4 * π * 7?) / 3 . Use the value 3.14 for π.
Hint 2:

$$\frac{4\times\Pi\times 7^3}{3}=\frac{4\times 3.14\times 343}{3}=\frac{4308.08}{3}\approx 1436$$

Please review the steps of the calculation.
Hint 3:
The correct answer is 1436. Please enter 1436.

(Problem ID: 13608) TEXT_FIELD [MA - 2003 - Spring - 12]

No knowledge components have been assigned
Good. How many cubic inches is the volume of the sphere of radius 14 in ? Round to the nearest integer.
Answers: (Interface Type: TEXT_FIELD)
✓ **11488**

Hint 1:
The volume will be equal to (4 * π * 14?) / 3 . Use the value 3.14 for π
Hint 2:

$$\frac{4\times\Pi\times 14^3}{3}=\frac{4\times 3.14\times 2744}{3}=\frac{34464.64}{3}\approx 11488$$

Please review the steps of the calculation.
Hint 3:
The correct answer is 11488. Please enter 11488.

(Problem ID: 13609) RADIO_BUTTON [MA - 2003 - Spring - 12]

No knowledge components have been assigned
Great. Which of the following is closest to the positive difference in the volumes of the two spheres represented by the drawings above?
Answers: (Interface Type: RADIO_BUTTON)
✗ 21,170 cu. in.
✗ 12,924 cu. in.
✗ 2,401 cu. in.
✓ **10,052 cu. in.**

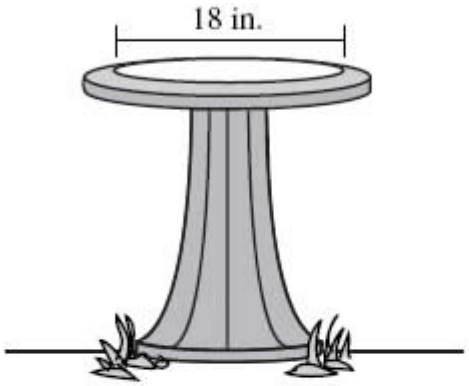
Hint 1:

You must subtract the values for the volumes of the the 2 spheres found above to find the difference.
Hint 2:
11,488 - 1,436 = 10,052. Therefore the correct answer is 10,052 cu. in. Please select 10,052 cu. in.
Hint 3:
The correct answer is 10,052 cu. in. Please select 10,052 cu. in.

17.) "autumn2004-24" (Problem ID: 13622) RADIO_BUTTON

No knowledge components have been assigned

The bowl of a circular birdbath has an inside diameter of 18 inches, as shown in the drawing below.



When the bowl of the birdbath is full of water, which of the following is closest to the area of the top surface of water?

A. 1017 sq. in.

B. 254 sq. in.

C. 113 sq. in.

D. 57 sq. in.

Please choose the right answer:
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✓ **B**
✗ C
✗ D

(Problem ID: 13623) RADIO_BUTTON

No knowledge components have been assigned

First we will determine the shape of the surface of the water and then calculate its surface area. What is the shape of the surface of the water in the birdbath?

Answers: (Interface Type: RADIO_BUTTON)

✗ elliptical
✗ rectangular
✓ **circular**
✗ spherical

Hint 1:
The correct answer is circular. Please select 'circular'.

(Problem ID: 13624) RADIO_BUTTON

No knowledge components have been assigned

Good. We need to find the area of the surface. What is the formula for the area of a circular surface of radius r?

Answers: (Interface Type: RADIO_BUTTON)

✗ πr
✓ πr^2
✗ πr^3
✗ $2\pi r$ *No, that is the formula for the circumference of a circle. Please try again*

Hint 1:
You can look at your refence sheet in order to find this formula.
Hint 2:
The correct answer is πr?. Please select πr?.

(Problem ID: 13625) TEXT_FIELD

No knowledge components have been assigned

Good. In order to use the formula for the area of the circle from above we need to find the radius of the circle. What is the radius of the circle?

Answers: (Interface Type: TEXT_FIELD)

✓ **9**

Hint 1:
The diameter of the circle is 18.
Hint 2:
radius = diameter / 2
Hint 3:
radius = 18 / 2
Hint 4:
The correct answer is 9. Please enter 9.

(Problem ID: 13626) RADIO_BUTTON

No knowledge components have been assigned

Good. Now, which of the following is the closest to the area of the surface of the water?

Answers: (Interface Type: RADIO_BUTTON)

✓ **254 sq. in.**
✗ 1017 sq. in.
✗ 57 sq. in.

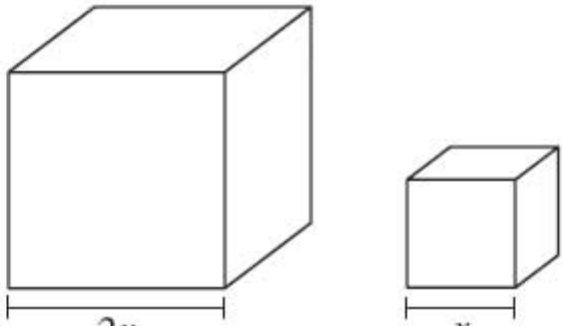
✗ 113 sq. in.

Hint 1:
Remember that the area of the circle is πr?. Substitute 9 for r and use the value 3.14 for π
Hint 2:
The answer is equal to π(9)? = 3.14 * (9)?
Hint 3:
3.14 * 9? = 3.14 * 81 = 254 sq. in.
Hint 4:
The correct answer is 254 sq. in. Please select 254 sq. in.

18.) "autumn2004-15" (Problem ID: 13630) TEXT_FIELD

No knowledge components have been assigned

An edge of Cube *A* is twice as long as an edge of Cube *B* as shown in the figure belo



What is the maximum number of the smaller cubes that will fit in the interior of the l

Please enter your answer:
Answers: (Interface Type: TEXT_FIELD)
✓ **8**

(Problem ID: 13631) RADIO_BUTTON

No knowledge components have been assigned

We will find the volumes of both cubes and then determine how many smaller cubes that will fit into the larger cube. What is the volume of a cube that has a side of length x?
Answers: (Interface Type: RADIO_BUTTON)
✗ $\pi x r^2$
✗ x^2
✗ $\pi x r^3$
✓ **x^3**

Hint 1:
The volume of a cube is calculated as the product between the width times length times height.

Hint 2:
The width, length and height of a cube are all equal.
Hint 3:
The correct answer is x?. Please select x?.

(Problem ID: 13632) RADIO_BUTTON

No knowledge components have been assigned

Good. What is the volume of a cube that has a side of length 2x?

Answers: (Interface Type: RADIO_BUTTON)

✗ $8x^2$
✗ $2x^3$
✗ $4x^2$
✓ **$8x^3$**

Hint 1:
V = side? = (2x)?
Hint 2:
V = 2x2x2x = 2*2*2*x*x*x = 8x?
Hint 3:
The correct answer is 8x?. Please select 8x?.

(Problem ID: 13633) TEXT_FIELD

No knowledge components have been assigned

Now we know the volume of the large cube and of the small cube. How many small cubes fit in the large cube?

Answers: (Interface Type: TEXT_FIELD)

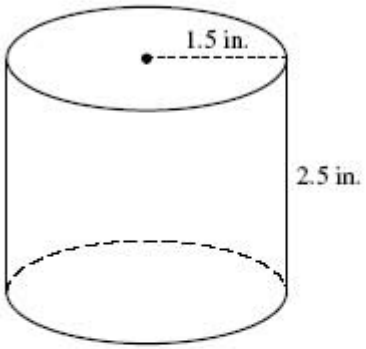
✓ **8**

Hint 1:
Divide the small cube into the large cube - write it as a fraction and simpify the x term.
Hint 2:
Simplfy the following fraction to get the answer: 8x? / x?. Note that the x? term is the same both in the numerator and denominator.
Hint 3:
You can simplify x? from the equation.
Hint 4:
The correct answer is 8. Please enter 8.

19.) "autumn2004-38" (Problem ID: 13769) RADIO_BUTTON [MA - 2001 - Spring - 1]

No knowledge components have been assigned

While calculating the lateral surface area of the right circular cylinder represented in the drawing below, Sharon misread the ruler and used 3.5 inches as the height.



Which of the following is closest to the difference between Sharon's result for the lateral surface area and the actual lateral surface area of the right circular cylinder?

A. 1.5 square inches too much

B. 3.75 square inches too much

C. 5.25 square inches too much

D. 9.5 square inches too much

Please choose the right answer below:
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✗ C
✓ **D**

(Problem ID: 13770) RADIO_BUTTON [MA - 2001 - Spring - 1]

No knowledge components have been assigned

We will determine the lateral surface area for both heights and subtract them. What is the lateral area of a right circular cylinder of radius r and height h?
Answers: (Interface Type: RADIO_BUTTON)
✗ πr^2
✗ $2\pi rh$
✗ $2\pi r^2$
✓ **$2\pi r^2+2\pi rh$**

Hint 1:
You can look at your reference sheet to find this area.
Hint 2:
The correct answer is 2πr?+2πrh. Please select 2πr?+2πrh.

(Problem ID: 13771) RADIO_BUTTON [MA - 2001 - Spring - 1]

No knowledge components have been assigned

$$\textit{wrong lateral area (with } h = 3.5) - \textit{correct lateral area (with } h = 2.5)$$

$$[2\pi(1.5)^2 + 2\pi(1.5)(3.5)] - [2\pi(1.5)^2 + 2\pi(1.5)(2.5)]$$

Using the formula and the data given we have the expression above for the difference between the wrong measure and the right measure. Use the rules of algebra to simplify this expression. What is the value when simplified?

Answers: (Interface Type: RADIO_BUTTON)

✗ 1.5
✗ 3.75
✗ 5.25
✓ **9.5**

Hint 1:

$$2\pi(1.5)^2 + 2\pi(1.5)(3.5) - 2\pi(1.5)^2 - 2\pi(1.5)(2.5)$$

Since you are subtracting the second terms you can rewrite the expression by distributing the terms.

Hint 2:

$$2\pi(1.5)(3.5) - 2\pi(1.5)(2.5)$$

Now you can cancel the term 2π(1.5)? because of the subtraction so your new expression will be simplified.

Hint 3:

$$2\pi(1.5)(3.5 - 2.5)$$

Factor out the common terms in order to further simplfy the expression

Hint 4:

Now you can subtract and you get 1 for the term (3.5 - 2.5), so your answer will be 2π(1.5) which is appr. 9.5

Hint 5:

The correct answer is 9.5. Please select 9.5.

20.) "spring2004-37" (Problem ID: 13881) RADIO_BUTTON [MA - 2005 - null - 8]

No knowledge components have been assigned

A right circular cylindrical can is 6 inches high, and the area of its top is 36π square inches. What is the minimum number of square inches of construction paper it would take to cover the lateral surface of this can?

Answers: (Interface Type: RADIO_BUTTON)

✗ 432π sq. in.
✗ 72 sq. in.
✓ **72π sq. in.**
✗ 432 sq. in.

(Problem ID: 13882) RADIO_BUTTON [MA - 2005 - null - 8]

No knowledge components have been assigned

Lets start by finding the formula for the lateral surface area of a cylinder. What is the formula for the lateral surface area of a cylinder of radius r and height h?

Answers: (Interface Type: RADIO_BUTTON)

✓ **2πrh**

✗ 4πr

✗ 4πrh

✗ 2πr + 2πrh

Hint 1:

You can check your reference sheet in order to find this formula

Hint 2:

The formula for the lateral area of a cylinder of radius r and height h is 2πrh.

The correct answer is 2πrh.

(Problem ID: 13883) TEXT_FIELD [MA - 2005 - null - 8]

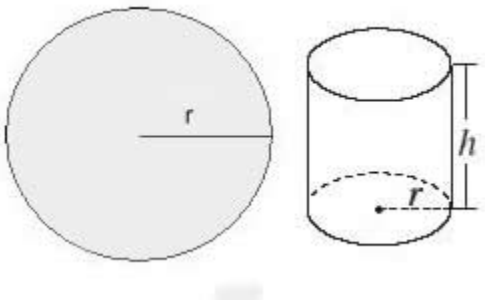
No knowledge components have been assigned

Good. In order to use the formula found above, we need the radius of the cylinder. How many cm is the radius of the cylinder?

Answers: (Interface Type: TEXT_FIELD)

✓ **6**

Hint 1:



Look at the figure above. Use what you know about the area of the circle in order to find r.

Hint 2:

Use the formula for the area of a circle A = πr? or, after substituting, 36π = πr?.

Hint 3:

$$36\pi = \pi r^2$$

$$\frac{36\pi}{\pi} = \frac{\pi r^2}{\pi}$$

$$36 = r^2$$

$$6 = r$$

Please review how to solve the equation for r.

Hint 4:

Now we know that the radius is 6, please enter 6.

(Problem ID: 13884) RADIO_BUTTON [MA - 2005 - null - 8]

No knowledge components have been assigned

Correct. Now use the radius in order to find the lateral area of the cylinder. What is the lateral area of the cylinder?

Answers: (Interface Type: RADIO_BUTTON)

✗ 72 sq. in.

✗ 432π sq. in.

✗ 432 sq. in.
✓ **72π sq. in.**

Hint 1:
Substitute the value you found for r and the given value of h in the formula lateral area = 2πrh
Hint 2:
When substituting 6 for r and 6 for h, you get lateral area = 2π(6)(6). Calculate the value of this expression to find the area.
Hint 3:
lateral area = 2π(6)(6) = 2π*36 = 72π.
Hint 4:
We now know that the lateral area is equal to 72π sq. in, please select this answer above.

21.) "spring2004-16" (Problem ID: 13915) ALGEBRA_FIELD [MA - 2001 - Spring - 34]

No knowledge components have been assigned

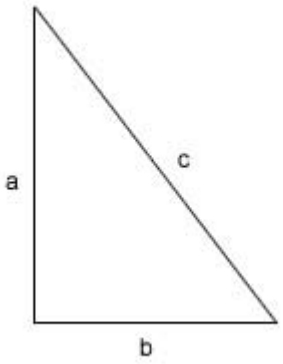
The length of the hypotenuse of a right triangle is 13 centimeters, and the length of one leg is 12 centimeters. How many centimeters is the area of the triangle?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **30**

(Problem ID: 13916) RADIO_BUTTON [MA - 2001 - Spring - 34]

No knowledge components have been assigned



In order to find the area of the triangle we must multiply the length of one leg "a" by the lenght of the other leg "b" and divide by 2. We don't know the length of the seccond leg however so we must find it. We can compute the length of the second leg from the relationship between the sides of a right triangle. What is the relationship between the sides a,b,c of a right triangle, where c is the measurement of the hypotenuse?

Answers: (Interface Type: RADIO_BUTTON)

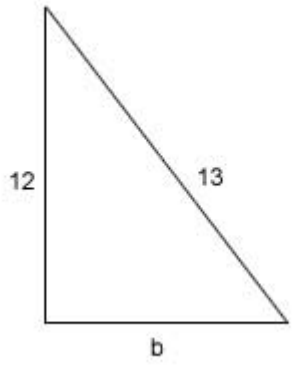
✓ **$c^2 = a^2 + b^2$**
✗ $b^2 = a + c$
✗ $b^2 = a^2 + c^2$
✗ $c = a + b$

Hint 1:

In order to get the right answer, you have to apply the Pythagorean theorem.
Hint 2:
The Pythagorean theorem states that the square of the length of the hypotenuse c is equal to the sum of the squares of the triangle's legs a and b.
Hint 3:
The correct answer is c? = a? + b?.

(Problem ID: 13917) ALGEBRA_FIELD [MA - 2001 - Spring - 34]

No knowledge components have been assigned



Good. Now use this relationship c? = a? + b? to find the length of the second leg in the figure above. How many centimeters is the length of b?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **5**

Hint 1:
Substitute 12 for a and 13 for c in the equation c? = a? + b? and then find b.
Hint 2:
Now solve 13? = 12? + b? .
Hint 3:
b? = 13?- 12?
b? = 169 - 144.
What is b?
Hint 4:
b? = 25. So b = √25 = 5. The answer is 5.

(Problem ID: 13918) ALGEBRA_FIELD [MA - 2001 - Spring - 34]

No knowledge components have been assigned

Good. Now how many centimeters is the area of the triangle?

Answers: (Interface Type: ALGEBRA_FIELD)

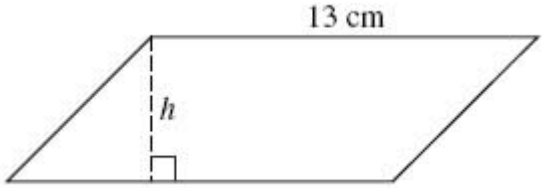
✓ **30**

Hint 1:
The area of a right triangle is the product of the legs divided by 2.
Hint 2:
Solve the following to ger the answer: Area = (a * b) / 2, where a and b are the legs of the triangle we have found above.
Hint 3:

Area = a * b = (12 * 5) / 2. What is the area?
Hint 4:
Area = (12 * 5) / 2
Area = 60 / 2
Area = 30
The answer is 30.

22.) "spring2004-22" (Problem ID: 13927) RADIO_BUTTON [MA - 2001 - Spring - 35]

No knowledge components have been assigned



What is h, the height of the parallelogram represented below, if its area is 91 square centimeters?
Answers: (Interface Type: RADIO_BUTTON)
✓ **7 cm**
✗ 9 cm
✗ 11 cm
✗ 15 cm

(Problem ID: 13928) RADIO_BUTTON [MA - 2001 - Spring - 35]

No knowledge components have been assigned

From the formula for the area of a parallelogram we will find the height. What is the area of a parallelogram with height h and base b?
Answers: (Interface Type: RADIO_BUTTON)
✗ 2bh
✓ **hb**
✗ bh/2
✗ (2/3)hb

Hint 1:
You can look at your reference sheet in order to find this formula.
Hint 2:
The correct answer is to multiple the base times the height. Please select hb.

(Problem ID: 13929) TEXT_FIELD [MA - 2001 - Spring - 35]

No knowledge components have been assigned

Good. Now, what is the length of the height of the parallelogram in centimeters?
Answers: (Interface Type: TEXT_FIELD)
✓ **7**

Hint 1:
We have the equation A = bh and we know that A = 91 and b = 13. Solve the equation to find h.
Hint 2:

So, 91 = 13 * h. We can therefore write that 91 / 13 = h
Hint 3:
h = 91 / 13 = 7. Therefore the correct answer is 7. Please enter 7.

23.) "spring2004-5" (Problem ID: 13930) RADIO_BUTTON [MA - 2001 - Spring - 35]

No knowledge components have been assigned

The wheels on Bill's bicycle each have a radius of 35 centimeters. Which of the following is closest to the distance the bicycle moves along the ground in one complete revolution of the wheels?

Answers: (Interface Type: RADIO_BUTTON)

✗ 35 cm
✗ 55 cm
✗ 110 cm
✓ **220 cm**

(Problem ID: 13931) RADIO_BUTTON [MA - 2001 - Spring - 35]

No knowledge components have been assigned

Image as the wheel rolls it leaves a mark on the ground. After one complete revolution of the wheel the length of the mark will be equal to the length of the circumference of the wheel. From the formula for the circumference of a circle we will determine the distance the bicycle moved along the ground. Let *r* be the radius of the circle. What is the circumference of the circle in terms of a constant, π and *r* ?

Answers: (Interface Type: RADIO_BUTTON)

✗ πr^2 *No, this is the formula for the area of the circle*
✗ πr
✓ **2πr**
✗ r^2

Hint 1:
You can look at the reference sheet in order to find this formula.
Hint 2:
The correct answer is 2πr. Please select 2πr.

(Problem ID: 13932) RADIO_BUTTON [MA - 2001 - Spring - 35]

No knowledge components have been assigned

Good. Which of the following measures is closest to the circumference of the circle?

Answers: (Interface Type: RADIO_BUTTON)

✗ 55 cm
✓ **220 cm**
✗ 35 cm
✗ 110 cm

Hint 1:
The circumference of a circle is equal to the distance the bicycle moves along the ground. Therefore, you have to substitute 35 for r in the equation C = 2πr to find the answer
Hint 2:
2π * (35 cm) = 70π cm We can use 3.14 for π
Hint 3:
So the answer is 219.91 cm - look at our choices and see which one is closest to this value. The correct answer is 220 cm. Please select 220 cm.

24.) "spring2006-26" (Problem ID: 13885) RADIO_BUTTON [MA - 2005 - null - 14]

No knowledge components have been assigned

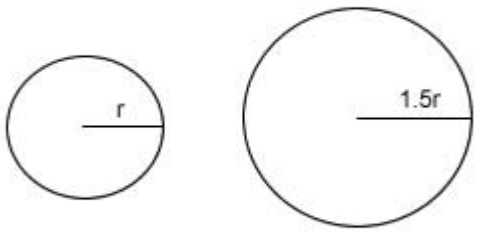
Kevin used snowballs in the shape of a sphere to build a snowman. The radius of the largest snowball was 1.5 times the radius of the smallest snowball. How many times greater was the volume of the largest snowball than the volume of the smallest snowball?

Answers: (Interface Type: RADIO_BUTTON)

✓ **3.375**
✗ 6.28
✗ 2.25
✗ 7.065

(Problem ID: 13886) RADIO_BUTTON [MA - 2005 - null - 14]

No knowledge components have been assigned



Let r be the radius of the smaller snowball. We will find the volume of both snowballs in terms of r and then find out how many of the small spheres fir in the large sphere. What is the formula for the volume of a sphere of radius r?

Answers: (Interface Type: RADIO_BUTTON)

✓ **$(4/3)\pi r^3$**
✗ $4\pi r^3$
✗ $(2/3)r^3$
✗ πr^3

Hint 1:
You can look at your reference sheet to find this formula.
Hint 2:
The formula for the volume of a sphere of radius r is (4/3)πr?.
The answer is (4/3)πr?.

(Problem ID: 13887) RADIO_BUTTON [MA - 2005 - null - 14]

No knowledge components have been assigned

Good. Now what is the volume of a sphere of radius **1.5r** ?
Answers: (Interface Type: RADIO_BUTTON)
✗ π(1.5)?r?
✗ (4/3)π(1.5)r? *This is close, but not correct. Don't forget to raise the term (1.5) to the third power*
✗ (4/3)πr?
✓ **(4/3)π(1.5)?r?**

Hint 1:
Everything stays the same in the formula found above except you substitute 1.5r in place of r.
Hint 2:
After substituting, we get (4/3)π(1.5r)? = (4/3)π(1.5)?r?
The answer is (4/3)π(1.5)?r?.

(Problem ID: 13888) RADIO_BUTTON [MA - 2005 - null - 14]

No knowledge components have been assigned
Good. You know that the snowballs are spheres with radii r and 1.5 r. How many times greater was the volume of the largest snowball than the volume of the smallest snowball?
Answers: (Interface Type: RADIO_BUTTON)
✗ 6.28
✗ 7.065
✓ **3.375**
✗ 2.25

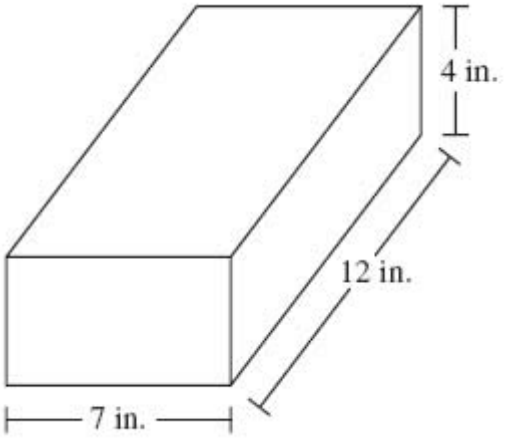
Hint 1:
You want to find out how many of the small snowballs fit in the big one so you must divide the volume of the big snowball by the volume of the small one
Hint 2:

$$\frac{\frac{4}{3}\pi(1.5)^3 r^3}{\frac{4}{3}\pi r^3}$$

Simplify the expression above to get the answer.
Hint 3:
Notice that the term (4/3)?r? can be simplified in the expression above.
Hint 4:
After simplifying, we see that we are left with only 1.5?, which will be our answer.
Hint 5:
1.5? = 3.375. Therefore the correct answer is 3.375.

25.) "spring2006-23" (Problem ID: 13891) RADIO_BUTTON

No knowledge components have been assigned



The diagram shows a right rectangular prism that is 7 inches wide, 12 inches long, and 4 inches high. What is the volume, in cubic inches, of the prism?

Answers: (Interface Type: RADIO_BUTTON)

✗ 320
✗ 184
✗ 152
✓ **336**

(Problem ID: 13892) RADIO_BUTTON

No knowledge components have been assigned

We will calculate the volume of the right rectangular prism using the formula for the volume. What is the formula for the volume of a right rectangular prism in terms of its width w, length L and height h?

Answers: (Interface Type: RADIO_BUTTON)

✗ 2πL
✗ whL / 4
✓ **whL**
✗ 2wL

Hint 1:
You can look at your reference sheet in order to find this formula.
Hint 2:
The correct answer for the formula for the volume of a right rectangular prism is whL.

(Problem ID: 13893) RADIO_BUTTON

No knowledge components have been assigned

Good. Now, what is the volume of the right rectangular prism in our problem?

Answers: (Interface Type: RADIO_BUTTON)

✓ **336**
✗ 184
✗ 152
✗ 320

Hint 1:
Use the formula for the volume of the right rectangular prism found above in order to find the answer.
Hint 2:

Volume = whL. Substitute the given values for width, heigth and length and find the volume.
Hint 3:
Volume = whL = 7 * 4 * 12. What is the volume?
Hint 4:
Volume = 7 * 4 * 12
Volume = 336
The answer is 336.

26.) "spring2006-18" (Problem ID: 13921) TEXT_FIELD [MA - 2001 - Spring - 34]

No knowledge components have been assigned

The volume of Anand's cube is 8 cubic centimeters. What is the total surface area, in square centimeters, of his cube?

Answers: (Interface Type: TEXT_FIELD)

✓ **24**

(Problem ID: 13922) TEXT_FIELD [MA - 2001 - Spring - 34]

No knowledge components have been assigned

We will calculate the length of the side of the cube in order to find out the surface area. What is the length of one side of the cube in centimeters?

Answers: (Interface Type: TEXT_FIELD)

✓ **2**

Hint 1:
The volume of a cube is V = r?, where r is the length of the side of the cube and V is equal to 8. Solve this equation
Hint 2:
So 8 = r?. What number can you multiply by itself three times to get 8?
Hint 3:
2*2*2 = 8 so r = 2. So the correct answer is 2. Please enter 2.

(Problem ID: 13923) RADIO_BUTTON [MA - 2001 - Spring - 34]

No knowledge components have been assigned

What is the formula for the total surface area of a cube of side r?

Answers: (Interface Type: RADIO_BUTTON)

✓ **$6r^2$**
✗ 2rh
✗ $4r^2$
✗ $2r^2 + 2rh$

Hint 1:
You can use your reference sheet in order to find this formula.
Hint 2:
The correct answer is 6r?. Please select 6r?.

(Problem ID: 13924) TEXT_FIELD [MA - 2001 - Spring - 34]

No knowledge components have been assigned

What is the total area of our cube with r = 2, in square centimeters?

Answers: (Interface Type: TEXT_FIELD)

✓ **24**

Hint 1:
You have to solve the equation A = 6r? where r = 2 to find the area of the cube.
Hint 2:
A = 6 * 2? = 6 * 2 * 2 = 24
Hint 3:
The correct answer is 24. Please enter 24.

27.) "autumn2005-9" (Problem ID: 13998) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned

The length of one edge of a cube is (x+3) units. Which of the following expressions represents the cube's total surface area in square units?

Answers: (Interface Type: RADIO_BUTTON)

✗ $6(x^2+9)$
✗ $(x+3)^2$
✗ x^2+9
✓ **$6(x+3)^2$**

(Problem ID: 13999) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned

The length of one edge of a cube is x. What is the formula of the total surface area of the cube?

Answers: (Interface Type: RADIO_BUTTON)

✗ 6x
✓ **$6x^2$**
✗ $6x^3$
✗ x^3

Hint 1:
You can look at your reference sheet in order to find this formula
Hint 2:
The correct answer is 6x?. Please select 6x?.

(Problem ID: 14006) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned

Good. The length of one edge of a cube is (x+3). What is the cube's total surface area?

Answers: (Interface Type: RADIO_BUTTON)

✗ x^2+9
✗ $(x+3)^2$
✓ **$6(x+3)^2$**
✗ $6(x^2+9)$

Hint 1:
Substitute (x + 3) in the formula for the total surface area we have established above.
Hint 2:
Substitute (x + 3) for x in the expression 6x?.
Hint 3:
The correct answer is 6(x+3)?. Please select 6(x+3)?.

28.) "autumn2005-12" (Problem ID: 14000) RADIO_BUTTON [MA - 2002 - Spring - 21]

No knowledge components have been assigned

Andrew used a wooden stick to estimate the length of a couch. Andrew, who is approximately 6 feet tall, measured his height to be about 1 and 1/2 sticks in length. He measured the couch to be about 2 sticks in length. Based on Andrew's measurements, which of the following is closest to the length of the couch?

Answers: (Interface Type: RADIO_BUTTON)

✗ 12 feet
✗ 18 feet
✓ **8 feet**
✗ 9 feet

(Problem ID: 14001) TEXT_FIELD [MA - 2002 - Spring - 21]

No knowledge components have been assigned

We can find the length of one stick and then obtain the length of the couch as two times that length. How many feet does 1 stick have?

Answers: (Interface Type: TEXT_FIELD)

✓ **4**

Hint 1:
Andrew is 6 feet tall and his height to be about 1 and 1/2 sticks in length.
Hint 2:
If 1.5 sticks have a length of 6 feet, then one stick will have the length of 6 / 1.5 feet.
Hint 3:
The correct answer is 4. Please enter 4.

(Problem ID: 14007) TEXT_FIELD [MA - 2002 - Spring - 21]

No knowledge components have been assigned

Good, now we know the length of one stick and also we know that the couch has the leghth of 2 sticks. What is the length of the couch?

Answers: (Interface Type: TEXT_FIELD)

✓ **8**

Hint 1:
The length of the couch is 2 * length of a stick.
Hint 2:
2 * 4 = 8. Therefore, the correct answer is 8. Please enter 8.

29.) "autumn2005-27" (Problem ID: 14002) RADIO_BUTTON [MA - 2001 - Spring - 7]

No knowledge components have been assigned

A cube has a surface area of 96 square inches. What is the volume of the cube?

Answers: (Interface Type: RADIO_BUTTON)

✗ 16 cubic inches
✗ 256 cubic inches
✓ **64 cubic inches**
✗ 96 cubic inches

(Problem ID: 14008) RADIO_BUTTON [MA - 2001 - Spring - 7]

No knowledge components have been assigned

What is the fomula for the surface area of a cube of edge x?

Answers: (Interface Type: RADIO_BUTTON)

✗ $6x^3$

✗ x^2

✗ x^3

✓ **$6x^2$**

Hint 1:

You can look at your formula sheet in order to find the answer.

Hint 2:

The correct answer is '6x?'. Please select '6x?'

(Problem ID: 14009) TEXT_FIELD [MA - 2001 - Spring - 7]

No knowledge components have been assigned

Good. Now, what is the length of the edge of a cube if the surface area is 96 square inches?

Answers: (Interface Type: TEXT_FIELD)

✓ **4**

Hint 1:

You know that the formula for the surface area is equal to 6x?. Therefore, to get the answer solve the equation 6x? = 96

Hint 2:

6x? = 96

x? = 96 /6

x? = 16

x = $\sqrt{}$16

x = 4

Hint 3:

The correct answer is '4'. Please enter '4' (without quotes).

(Problem ID: 14010) RADIO_BUTTON [MA - 2001 - Spring - 7]

No knowledge components have been assigned

Good. What is the formula of the volume of a cube of edge x ?

Answers: (Interface Type: RADIO_BUTTON)

✓ **x^3**

✗ x^2

✗ $2x^3$

✗ $3x$

Hint 1:

You can look at your formula sheet in order to find the answer.

Hint 2:

The correct answer is 'x?'. Please select 'x?'

(Problem ID: 14011) TEXT_FIELD [MA - 2001 - Spring - 7]

No knowledge components have been assigned

Correct. Now, what is the volume of a cube with an edge of 4 inches?

Answers: (Interface Type: TEXT_FIELD)

✓ **64**

Hint 1:
You know that the formula for the volume is equal to x? and that x, the side of the cube, is equal to 4.
Hint 2:
To get the answer solve the equation V = x?, where x = 4
Hint 3:
V = x?
V = 4?
V = 64
Hint 4:
The correct answer is 64. Please enter 64

30.) "autumn2005-16" (Problem ID: 14003) TEXT_FIELD [MA - 2001 - Spring - 7]

No knowledge components have been assigned

A landscape artist plans to create a garden on the front lawn of an art museum. The garden will be in the shape of a trapezoid. If the height of the trapezoid is 15 feet, and its bases measure 14 feet and 20 feet, what is the area, in square feet, of the trapezoid?

Answers: (Interface Type: TEXT_FIELD)

✓ **255**

(Problem ID: 14004) RADIO_BUTTON [MA - 2001 - Spring - 7]

No knowledge components have been assigned

Consider the trapezoid with bases b1 and b2 and heigth h. What is the formula for the area of the trapezoid?

Answers: (Interface Type: RADIO_BUTTON)

✗ b1*h/2
✗ (b1+h)*b2/2
✗ (b1+b2)*h
✓ **(b1+b2)*h/2**

Hint 1:
You can look at your reference sheet in order to find this formula.
Hint 2:
The area of the trapezoid is (b1+b2)*h/2. Please select (b1+b2)*h/2

(Problem ID: 14005) TEXT_FIELD [MA - 2001 - Spring - 7]

No knowledge components have been assigned

What is the area of the trapezoid that has a height of 15 feet and the bases measure 14 feet and 20 feet?

Answers: (Interface Type: TEXT_FIELD)

✓ **255**

Hint 1:
Use the formula for the area of a trapezoid and substitute the given values in order to get the answer.
Hint 2:
Solve A = (b1+b2)*h/2 where b1 = 14, b2 = 20 and h = 15
Hint 3:

A = (b1+b2)*h/2
A = (14+20)*15/2
A = 34*15/2
A = 510/2
A = 255
Hint 4:
The correct answer is 255. Please enter 255

31.) "autumn2005-29" (Problem ID: 14012) RADIO_BUTTON

No knowledge components have been assigned

Mr. Kentfield trains racehorses on a farm in Hampshire County. The horses train on a circular track with an inner circumference of 440 yards. Which of the following is closest to the area enclosed by the track?

Answers: (Interface Type: RADIO_BUTTON)

✓ **15,400 square yards**
✗ 30,800 square yards
✗ 61,600 square yards
✗ 48,400 square yards

(Problem ID: 14013) RADIO_BUTTON

No knowledge components have been assigned

In order to calculate the area we will need to know the radius of the circle. We can use the formula for the circumference to calculate the readius. First however we will need the formula for the circumference of a circle. What is the formula for the circumference of a circle of radius r ?

Answers: (Interface Type: RADIO_BUTTON)

✗ πr^2 *This is formula for the area of a circle. Please try again*
✗ 2r
✓ **2πr**
✗ r?

Hint 1:
You can look in your reference sheet in order to find this formula.
Hint 2:
The answer is 2πr.

(Problem ID: 14014) RADIO_BUTTON

No knowledge components have been assigned

Good. Now, what is the radius of a circle of circumference 440 yards?

Answers: (Interface Type: RADIO_BUTTON)

✓ **220/π**
✗ 220/π?
✗ 440/π?
✗ 440/π

Hint 1:
We know that C = 2?r and that C = 440. Find r in this equation.
Hint 2:

$$440 = 2\pi r$$

$$\frac{440}{2\pi} = \frac{2\pi r}{2\pi}$$

$$\frac{440}{2\pi} = r$$

Please review the solution to the equation
Hint 3:
440/2 = 220. The answer is 220/?.

(Problem ID: 14015) RADIO_BUTTON

No knowledge components have been assigned
What is the formula for the area of a circle of radius r ?
Answers: (Interface Type: RADIO_BUTTON)
✓ **πr^2**
✗ πr^3
✗ r?
✗ 2r?

Hint 1:
You can look in your reference sheet in order to find this formula.
Hint 2:
The answer is πr^2

(Problem ID: 14016) RADIO_BUTTON

No knowledge components have been assigned
Good. Now, what is the area of a circle of radius 220/π?
Answers: (Interface Type: RADIO_BUTTON)
✗ 220/π
✗ $220/\pi^2$
✓ **48,400/π**
✗ $48,400/\pi^2$

Hint 1:
We know the area of the circle is πr? and we also know that r = 220 / π. You can now find the area.
Hint 2:

$$Area = \pi r^2 = \pi\left(\frac{220}{\pi}\right)^2 = \pi\frac{220^2}{\pi^2} = \frac{220^2}{\pi} = \frac{48400}{\pi}$$

Please review the solution to the equation.
Hint 3:
The answer is 48,400/π.

(Problem ID: 14017) RADIO_BUTTON

No knowledge components have been assigned
Good. To answer the original question: Mr. Kentfield trains racehorses on a farm in Hampshire County. The horses train on a circular track with an inner circumference of 440 yards. Which of the following is closest to the area enclosed by the track?
Answers: (Interface Type: RADIO_BUTTON)

✗ 48,400 square yards
✗ 30,800 square yards
✓ **15,400 square yards**
✗ 61,600 square yards

Hint 1:
The area obtained in the previous question is 48,400/π. Approximate π to 3.14 and calculate the result.
Hint 2:
48,400/π = 48,400 / 3.14 = 15,406. Which of our answers is this closest to?
Hint 3:
15,406 is closest to 15,400. Therefore, the answer is 15,400 square yards.

32.) "autumn2005-33" (Problem ID: 14018) RADIO_BUTTON

No knowledge components have been assigned

The perimeter of a rectangle is 48 inches. The length of the rectangle is 3 times the width of the rectangle. What is the area of the rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✓ **108 square inches**
✗ 24 square inches
✗ 432 square inches
✗ 54 square inches

(Problem ID: 14019) RADIO_BUTTON

No knowledge components have been assigned

What is the formula for the perimeter of a rectangle of length l and width w?

Answers: (Interface Type: RADIO_BUTTON)

✗ w^2+l^2
✗ w+l
✗ 2w+l
✓ **2(w+l)**

Hint 1:
We know the perimeter is the sum of all the sides of the rectangles.
Hint 2:
The rectangle has 2 sides of length l and 2 sides of length w. Add these to get the answer.
Hint 3:
The correct answer is 2(w+l).

(Problem ID: 14020) RADIO_BUTTON

No knowledge components have been assigned

In our case, we know that the length of the rectangle is 3 times the width of the rectangle. So, what is the formula for the perimeter of the rectangle in terms of only the width w?

Answers: (Interface Type: RADIO_BUTTON)

✗ 16w
✗ 4w
✗ 6w
✓ **8w**

Hint 1:
We know that l= 3w and that the perimeter is equal to 2(w + l). Find a formula for the perimeter only in terms of w by substituring 3w for l.
Hint 2:
Perimeter=2(3w+w). Solve this equation to get the answer.
Hint 3:
Perimeter=2(4w) = 8w. The answer is therefore 8w
Hint 4:
Answer 8w

(Problem ID: 14021) TEXT_FIELD

No knowledge components have been assigned
We know that the perimeter is equal to 48 and we have also found out that the perimeter is equal to 8w. So, what is the width of the rectangle?
Answers: (Interface Type: TEXT_FIELD)
✓ **6**

Hint 1:
Solve the following equation to get the answer: 8w= 48
Hint 2:
8w= 48, so w = 48 / 8 = 6. Therefore the answer is 6.

(Problem ID: 14022) TEXT_FIELD

No knowledge components have been assigned
Now we can also find the length of the triangle. What is the length of the rectangle?
Answers: (Interface Type: TEXT_FIELD)
✓ **18**

Hint 1:
We know that the length is 3 times the width of the rectangle. So, solve l=3w to get the value of l.
Hint 2:
The width of the rectangle is 6. Therefore, l=3(6) = 18. The answer is 18

(Problem ID: 14023) RADIO_BUTTON

No knowledge components have been assigned
Good. Now, what is the formula for the area of a rectangle in terms of the lenght l and the width w?
Answers: (Interface Type: RADIO_BUTTON)
✗ w+l?
✓ **wl**
✗ w+l
✗ 2wl

Hint 1:
You can look in your reference sheet in order to find this formula.
Hint 2:
The area of a rectangle is wl.

(Problem ID: 14024) TEXT_FIELD

No knowledge components have been assigned

We know both the values of the width and the length of hte rectangle. Therefore, what is the area of the rectangle?

Answers: (Interface Type: TEXT_FIELD)

✓ **108**

Hint 1:

The area is equal to wl, where w = 6 and l = 18.

Hint 2:

Area = wl = (6)(18) = 108. The answer is 108

33.) "autumn2005-40" (Problem ID: 14025) RADIO_BUTTON

No knowledge components have been assigned

Which of the following is a true statement?

Answers: (Interface Type: RADIO_BUTTON)

✓ **Doubling the radius of a sphere increases its surface area 4 times.**

✗ Doubling the radius of a sphere increases its volume 6 times.

✗ Doubling the radius of a right circular cylinder while the height remains constant increases its volume 8 times.

✗ Doubling the radius of a right circular cylinder while the height remains constant increases its surface area 4 times.

(Problem ID: 14030) RADIO_BUTTON

No knowledge components have been assigned

We will look at each of the options in order to check the validity of the statements. Doubling the radius of a right circular cylinder while the height remains constant increases its surface area 4 times. Is this True or False?

Answers: (Interface Type: RADIO_BUTTON)

✗ True

✓ **False**

Hint 1:

The surface area of a right circular cylinder with radius r and heigth h is 2(π)(h+r?). Now substitute r with 2r in the equation to see what happens.

Hint 2:

The surface area of a right circular cylinder with radius 2r and height h is 2(π)(h+4r?). Decide whether this is is equal to 4*2(π)(h+r?).

Hint 3:

2(π)(h+4r?) = 8(π)(h+r?) - This is False, because 2πh+8r? is not equal to 8πh+8r?. **Please select False.**

(Problem ID: 14031) RADIO_BUTTON

No knowledge components have been assigned

Next, let's look at another option. Doubling the radius of a right circular cylinder while the height remains constant increases its volume 8 times. Is this True or False?

Answers: (Interface Type: RADIO_BUTTON)

✗ True

✓ **False**

Hint 1:
The volume of a right circular cylinder with radius r and heigth h is πr?h. Now substitute r with 2r in the equation to see what happens.
Hint 2:
The surface area of a right circular cylinder with radius 2r and height h is 4πr?h. Decide whether this is equal to 8πr?h.
Hint 3:
4πr?h is not equal to 8πr?h. Therefore the answer is **False**

(Problem ID: 14032) RADIO_BUTTON

No knowledge components have been assigned

Good. Let's look at another option. Doubling the radius of a sphere increases its volume 6 times. Is this True or False?

Answers: (Interface Type: RADIO_BUTTON)

✓ **False**

✗ True

Hint 1:
The volume of a sphere of radius r is 4πr?/3. Now substitute r with 2r in the equation to see what happens.
Hint 2:
The volume of a sphere or radius 2r is 4(π)(8r?)/3. Decide whether this is equal to 6*4πr?/3.
Hint 3:
32πr?/3 is not equal to 24πr?/3. Therefore the answer is **False**

(Problem ID: 14033) RADIO_BUTTON

No knowledge components have been assigned

This leaves us one more option that we have not looked at and we consider now. Doubling the radius of a sphere increases its surface area 4 times. Is this True or False?

Answers: (Interface Type: RADIO_BUTTON)

✓ **True**

✗ False

Hint 1:
The surface area of a sphere of radius r is 4(π)r?. Now substitute r with 2r in the equation to see what happens.
Hint 2:
The surface area of a sphere of radius r is 4(π)(4r?). Decide whether this is equal to 16(π)r?.
Hint 3:
16(π)r? = 16(π)r? - this is True, therefore this is the answer we were looking for.

34.) "march2006-14" (Problem ID: 14034) RADIO_BUTTON

No knowledge components have been assigned

If a cube has a volume of 27 cubic centimeters, what is the total surface area of the cube?

Answers: (Interface Type: RADIO_BUTTON)

✗ 9 cm²

✗ 36 cm²

✓ **54 cm²**

✗ 81 cm²

(Problem ID: 14035) RADIO_BUTTON

No knowledge components have been assigned

What is the formula for the volume of a cube with edge x ?

Answers: (Interface Type: RADIO_BUTTON)

✗ x^2

✓ **x^3**

✗ $2x^2$

✗ $3x$

Hint 1:

You can look in your reference sheet in order to find this formula.

Hint 2:

The volume is x?.

(Problem ID: 14036) TEXT_FIELD

No knowledge components have been assigned

What is the length of an edge of a cube that has a volume of 27 cubic centimeters?

Answers: (Interface Type: TEXT_FIELD)

✓ **3**

Hint 1:

We know that the volume of a cube is x? and we also know that the volume is 27. Find x.

Hint 2:

Solve the following equation: 27=x?. In other words, find x such that x*x*x = 27.

Hint 3:

3*3*3 = 27. Therefore the answer is 3.

(Problem ID: 14037) RADIO_BUTTON

No knowledge components have been assigned

What is the formula for the total surface area of a cube of edge x ?

Answers: (Interface Type: RADIO_BUTTON)

✓ **$6x^2$**

✗ x^3

✗ x^2

✗ $4x^2$

Hint 1:

You can look in your reference sheet in order to find this formula.

Hint 2:

The total surface area is 6x?.

(Problem ID: 14038) TEXT_FIELD

No knowledge components have been assigned

Good. Now, what is the total surface area of a cube that has an edge of 3 centimeters?

Answers: (Interface Type: TEXT_FIELD)

✓ **54**

Hint 1:

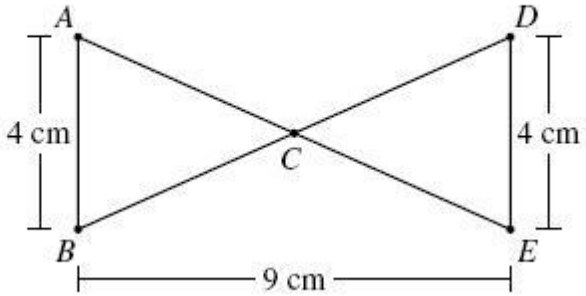
We know that the total surface area of the cube is 6x? and we have also found out that the edge is 3 cm.

Hint 2:
Solve the following equation to get the answer: Total surface area = 6x?, where x = 3.
Hint 3:
The total surface area is 6(3?) = 6 * 9 = 54

35.) "march2006-19" (Problem ID: 14039) TEXT_FIELD

No knowledge components have been assigned

In the figure below, $\overline{AB}$ is parallel to $\overline{DE}$, and $\overline{AE}$ intersects $\overline{BD}$ at point C.



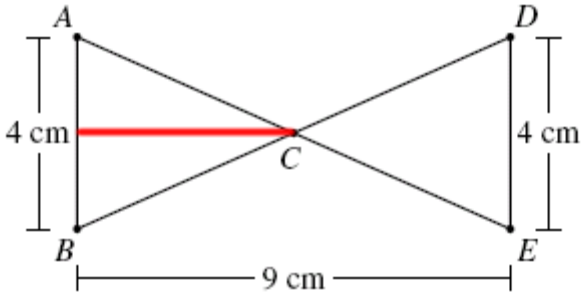
What is the sum, in square centimetes, of the area of triangle ABC and triangle EDC?
Answers: (Interface Type: TEXT_FIELD)
✓ **18**

(Problem ID: 14040) TEXT_FIELD

No knowledge components have been assigned

In order to find the sum of the areas of the 2 triangles we will first find the area of each one and then add them together. Let's start with triangle ABC. To find its area, we need the length of its height. What is the length of the height of triangle ABC?
Answers: (Interface Type: TEXT_FIELD)
✓ **4.5**

Hint 1:
ABED is a rectangle with diagonals AE and BD, which intersect at point C.
Hint 2:



As shown in the figure, the height of triangle ACB is perpendicular on AB and parallel to AD and BE.
Hint 3:
The height of triangle ACB is half the length of BE.
Hint 4:

The length of BE is 9 cm.
Hint 5:
The length of the height is 4.5.

(Problem ID: 14041) TEXT_FIELD

No knowledge components have been assigned
What is the length of the height of triangle ECD?
Answers: (Interface Type: TEXT_FIELD)
✔ **4.5**
Hint 1:
ABED is a rectangle with diagonals AE and BD, which intersect at point C
Hint 2:
The height of triangle ECD is perpendicular on DE and parallel to AD and BE
Hint 3:
The height of triangle ECD is half the length of BE
Hint 4:
The length of BE is 9 cm
Hint 5:
The length of the height is 4.5

(Problem ID: 14042) TEXT_FIELD

No knowledge components have been assigned
What is the area of triangle ABC?
Answers: (Interface Type: TEXT_FIELD)
✔ **9**
Hint 1:
The area of a triangle of height h and base b is b*h/2.
Hint 2:
The area of a triangle of height 4.5 and base 4 is (4)(4.5)/2
Hint 3:
The answer is 18 / 2 = 9.

(Problem ID: 14043) TEXT_FIELD

No knowledge components have been assigned
What is the area of triangle EDC?
Answers: (Interface Type: TEXT_FIELD)
✔ **9**
Hint 1:
The area of a triangle of height h and base b is b*h/2,
Hint 2:
The area of a triangle of height 4.5 and base 4 is (4)(4.5)/2.
Hint 3:
The answer is 18 / 2 = 9.

(Problem ID: 14044) TEXT_FIELD

No knowledge components have been assigned
What is the sum of the area of triangle ABC and triangle EDC?
Answers: (Interface Type: TEXT_FIELD)

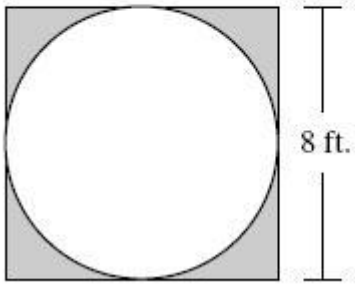
✓ **18**

Hint 1:
The area of triangle ABC is 9 and the area of triangle EDC is also 9. Add the two areas to get the answer.
Hint 2:
The answer is 9 + 9 =18.
Hint 3:
The answer is 9+9 =18

36.) "march2006-27" (Problem ID: 14045) RADIO_BUTTON

No knowledge components have been assigned

The figure below shows a circle inscribed in a square. Each side of the square has a length of 8 feet.



Which of the following is closest to the area of the shaded part of the square?
Answers: (Interface Type: RADIO_BUTTON)
✓ **14 sq. ft.**
✗ 39 sq. ft.
✗ 50 sq. ft.
✗ 7 sq. ft.

(Problem ID: 14046) TEXT_FIELD

No knowledge components have been assigned
Look at the 2 geometrical figures in the figure. We can see that we have a circle inscribed in a square. To find the shaded area, we have to subtract the area of the circle from the area of the square. What is the area of the square?
Answers: (Interface Type: TEXT_FIELD)
✓ **64**

Hint 1:
The formula for the area of a square with side x is x?.
Hint 2:
Substitute x = 8 in x? to get the answer.
Hint 3:
The answer is 8? = 64.

(Problem ID: 14047) RADIO_BUTTON

No knowledge components have been assigned

Good. Now let's try to find the area of the circle. Which of the following is the closest to the area of the circle?

Answers: (Interface Type: RADIO_BUTTON)

✗ 34.56
✗ 78.45
✗ 83.71
✓ **50.27**

Hint 1:
The formula for the area of a circle of diameter d is (π)(d?)/4.
Hint 2:
The diameter of the circle is equal to 8cm. Substitute this in the equation (π)(d?)/4 to find the area of the circle
Hint 3:
Solve the following to get the answer: Area = (π)(8?)/4.
Hint 4:
Area = (π)(8?)/4 = 64π/4 = 16π = 16 * 3.14 =~ 50.27. Therefore the answer is 50.27

(Problem ID: 14048) RADIO_BUTTON

No knowledge components have been assigned

Great. Now, which of the following is the closest to the area of the shaded region?

Answers: (Interface Type: RADIO_BUTTON)

✗ 50 sq. ft.
✓ **14 sq. ft.**
✗ 39 sq. ft.
✗ 7 sq. ft.

Hint 1:
The area of the shaded region = area of the square - area of the circle
Hint 2:
We have found the area of the square to be 64s q. ft. and the area of the circle 50.27 sq. ft.. Substact this and then find the closest answer to the result.
Hint 3:
The area of the shaded region = area of the square - area of the circle = 64-50.27 =~ 14. Therefore, the answer is 14 sq. ft.

37.) "march2006-32" (Problem ID: 14049) RADIO_BUTTON

No knowledge components have been assigned

Tona is training her dog, Daisy, to walk around a circle with a radius 4 feet. If Daisy walks 1 time around the circle, which of the following is closest to the distance she will walk?

Answers: (Interface Type: RADIO_BUTTON)

✗ 12 ft.
✓ **24 ft.**
✗ 48 ft.
✗ 6 ft.

(Problem ID: 14050) RADIO_BUTTON

No knowledge components have been assigned

Going around a circle once is equal to the circumference of that circle. What is the formula for the circumference of a circle of radius r?

Answers: (Interface Type: RADIO_BUTTON)

✗ πr? *This is the formula for the area of the circle. Please try again*

✗ r?

✗ πr

✓ **2πr**

Hint 1:
You can look in your reference sheet to in order to find this formula.
Hint 2:
The circumference of a circle of radius r is 2πr.

(Problem ID: 14051) RADIO_BUTTON

No knowledge components have been assigned

Which of the following is the closest to the circumference of a circle of radius 4 feet? Approximate π to 3.14 to get the answer.

Answers: (Interface Type: RADIO_BUTTON)

✗ 6 ft.

✗ 48 ft.

✗ 12 ft.

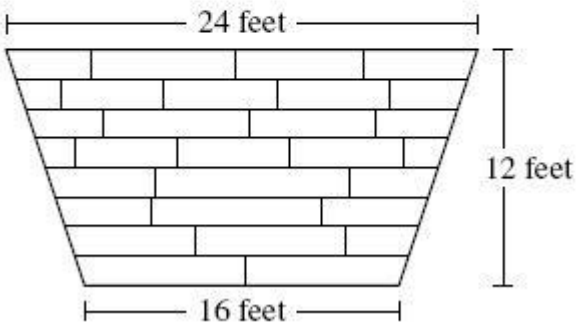
✓ **24 ft.**

Hint 1:
Substitute r = 4 in the equation found above: Circumference = 2πr
Hint 2:
Solve the following to get your answer: Circumference = 2(π)(4)
Hint 3:
The circumference of the circle is 2(π)(4) = 8π =~ 25. This is closest to 24 ft.
Hint 4:
The answer is 24 ft.

38.) "march2006-35" (Problem ID: 14052) RADIO_BUTTON

No knowledge components have been assigned

Jeff helped his uncle build a backyard deck. The top of the deck is shaped like a trapezoid. The dimensions of the top of the deck are shown in the diagram below.



What is the area of the top of the deck?
Answers: (Interface Type: RADIO_BUTTON)
✓ **240 sq. ft.**
✗ 96 sq. ft.
✗ 480 sq. ft.
✗ 288 sq. ft.

(Problem ID: 14053) RADIO_BUTTON

No knowledge components have been assigned
What is the formula for the area of a trapezoid of height h and bases b1 and b2 ?
Answers: (Interface Type: RADIO_BUTTON)
✓ **(b1+b2)*h/2**
✗ (b1*h+b2)/2
✗ b1*b2*h
✗ (b1+b2)/2

Hint 1:
You can look in your reference sheet in order to find this formula.
Hint 2:
The area is (b1+b2)*h/2.

(Problem ID: 14054) TEXT_FIELD

No knowledge components have been assigned
Good. Now, what is the area of a trapezoid of height 12 feet and bases of 16 feet and 24 feet?
Answers: (Interface Type: TEXT_FIELD)
✓ **240**

Hint 1:
Substitute h = 12, b1 = 16 and b2 = 24 in the equation found above (b1+b2)h/2.
Hint 2:
Solve the following equation to get the answer: Area = (16+24)(12)/2.
Hint 3:
Area = (16+24)(12)/2 = 40*12 / 2 = 480 / 2 = 240. Therefore the answer is 240.

39.) "march2006-37" (Problem ID: 14055) RADIO_BUTTON

No knowledge components have been assigned
Which of the following is closest to the total surface area of a sphere with a radius of 6 centimeters?
Answers: (Interface Type: RADIO_BUTTON)
✗ 151 cm?
✗ 113 cm?
✓ **452 cm?**
✗ 301 cm?

(Problem ID: 14056) RADIO_BUTTON

No knowledge components have been assigned
What is the formula for the total surface area of a sphere of radius r?
Answers: (Interface Type: RADIO_BUTTON)
✗ 2(π)r

✓ **4(π)r?**
✗ (π)r
✗ (π)r?

Hint 1:
You can look at your formula sheet in order to find this formula.
Hint 2:
The total surface area is 4(π)r?.

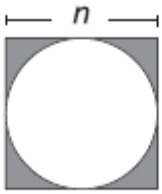
(Problem ID: 14057) RADIO_BUTTON

No knowledge components have been assigned
Which of the following is closest to the total surface area of a sphere of radius 6 centimeters? Approximate π to 3.14 in your calculations
Answers: (Interface Type: RADIO_BUTTON)
✗ 151 cm²
✗ 113 cm²
✓ **452 cm²**
✗ 301 cm?

Hint 1:
Substitute r = 6 in the equation 4(π)r? found above.
Hint 2:
The total surface area is 4(π)(6?). Solve this to get the answer.
Hint 3:
The total surface area is equal to 4(π)(6?) = 4(π)36 = 144(π) = 144 * 3.14 =~ 452. So the answer is 452.

40.) "spring2001-28" (Problem ID: 15187) RADIO_BUTTON

No knowledge components have been assigned



Which expression represents the area of the shaded portion of the square below?
Answers: (Interface Type: RADIO_BUTTON)
✗ $n^2 - (\pi * n^2)$
✗ $n^2 - \pi * n$
✗ $n^2 - 2 * \pi * n$
✓ **$n^2 - (n/2)^2\pi$**

(Problem ID: 15188) RADIO_BUTTON

No knowledge components have been assigned
Look at the 2 geometrical figures in the figure. We can see that we have a circle inscribed in a square. To find the shaded area, we have to subtract the area of the circle from the area of the square. What is the area of the square of side n?
Answers: (Interface Type: RADIO_BUTTON)

✓ **n?**
✗ 2n?
✗ 4n
✓ **n?**

Hint 1:
The formula for the area of a square with side n is n?. Therefore the answer is n?.

(Problem ID: 15189) RADIO_BUTTON

No knowledge components have been assigned

Good. Now let's try to find the area of the circle. What is the area of the circle of diameter n?

Answers: (Interface Type: RADIO_BUTTON)

✗ 2πn
✗ 2πn²
✓ **πn²/4**
✗ πn²

Hint 1:
The formula for the area of a circle of diameter n is (π)(n?)/4.

(Problem ID: 15190) RADIO_BUTTON

No knowledge components have been assigned

Great. Now, which of the following is the area of the shaded region?

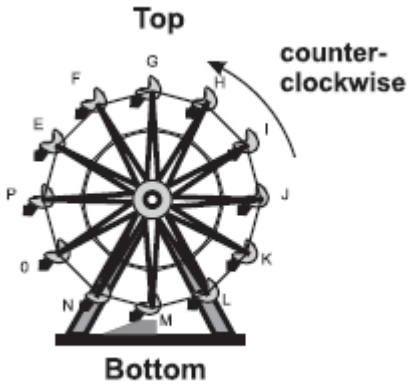
Answers: (Interface Type: RADIO_BUTTON)

✗ n? - 2*π*n
✗ n? - π*n
✗ n? - (π*n?)
✓ **n? - (n/2)?π**

Hint 1:
The area of the shaded region = area of the square - area of the circle
Hint 2:
We have found that the area of the square is n?.
Hint 3:
We have found that the area of the circle is πn?/4.
Hint 4:
The area of the shaded region = area of the square - area of the circle = n? - πn?/4

41.) "spring2001-33" (Problem ID: 15191) RADIO_BUTTON

No knowledge components have been assigned



Each ride on the Ferris wheel consists of 6 rotations. If the length of each of the spokes from the center of the wheel to a seat is t feet, how far will each passenger travel during a ride?
Answers: (Interface Type: RADIO_BUTTON)
✗ 6πt feet
✗ 12t feet
✗ 6t feet
✓ **12πt feet**

(Problem ID: 15192) RADIO_BUTTON

No knowledge components have been assigned
A rotation in the Ferris wheel has the same length as the circumference of a circle. We know that the length of each of the spokes from the center of the wheel to a seat is t feet, which means that the radius of the circle is equal to t. So, what is the circumference of the wheel?
Answers: (Interface Type: RADIO_BUTTON)
✗ πt feet
✓ **2πt feet**
✗ 2t feet
✗ 2πt? feet

Hint 1:
The formula for finding the circumference of a circle of radius x is 2πx.
Hint 2:
In our case the radius is equal to t, so the answer is 2πt.

(Problem ID: 15193) RADIO_BUTTON

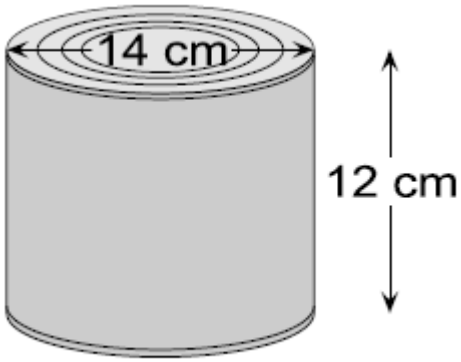
No knowledge components have been assigned
Good. So, how far will the passenger travel in feet if he goes around the wheel 6 times?
Answers: (Interface Type: RADIO_BUTTON)
✗ 6t feet
✗ 6πt feet
✗ 12t feet
✓ **12πt feet**

Hint 1:
6 rotations of the wheel are equivalent to 6 times the circumference of the wheel.
Hint 2:
We know that circumference of the wheel is 2πt. Multiply this by 6 to get the answer.
Hint 3:

Total length traveled by passenger = 6 * circumference of the wheel = 6*2πt = 12πt.
Therefore, the answer is 12πt.

42.) "spring2001-38" (Problem ID: 15216) RADIO_BUTTON [PA - 2005 - Spring - 2]

No knowledge components have been assigned



CanCorp is determining the cost of labels for new cans with the dimensions shown in the picture. The label for each can will wrap around the side of the can with no overlap.What is the approximate area of one label?

Answers: (Interface Type: RADIO_BUTTON)

✗ 1847 cm²
✗ 264 cm²
✓ **528 cm²**
✗ 924 cm²

(Problem ID: 15217) RADIO_BUTTON [PA - 2005 - Spring - 2]

No knowledge components have been assigned

Since the label for each can will wrap around the side of the can with no overlap, that means that we want to determine the lateral area of the cylinder to get the answer. What is the formula for the lateral area of a cylinder of diameter n and height h?

Answers: (Interface Type: RADIO_BUTTON)

✗ hd
✓ **πdh**
✗ 2hd
✗ 2dπh

Hint 1:
You can look in your reference sheet in order to find this formula.
Hint 2:
The correct answer for the formula is πdh.

(Problem ID: 15218) RADIO_BUTTON [PA - 2005 - Spring - 2]

No knowledge components have been assigned

Good. Using the dimensions shown in the picture, what is the approximate area of one label in cm??

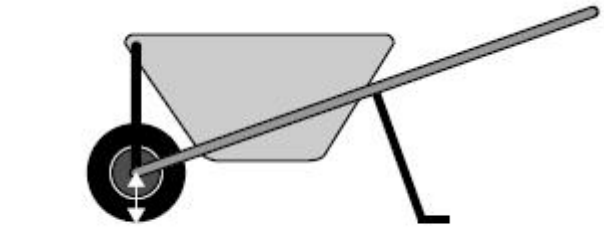
Answers: (Interface Type: RADIO_BUTTON)

✗ 264 cm?
✓ **528 cm?**
✗ 924 cm?
✗ 1847 cm?

Hint 1:
We know that to find the area of the label we need to find the lateral area of the triangle.
Hint 2:
We found out that the lateral area of the cylinder is πdh and we know that d = 14 cm? and h = 12 cm?. Substitute these values into the area formula to get the answer.
Hint 3:
Area = πdh = (14)(12)(π) = 168π ~ 527.788. So the answer is 528 cm?.

43.) "autumn2001-17" (Problem ID: 15226) RADIO_BUTTON

No knowledge components have been assigned



radius = 6 inches

The wheel on Javier's wheelbarrow has a radius of 6 inches. Javier pushed the wheelbarrow so that the wheel rotated 3 times. How many inches did the wheel travel in 3 rotations?
Answers: (Interface Type: RADIO_BUTTON)
✗ 12π
✗ 36
✓ **36π**
✗ 6π

(Problem ID: 15227) RADIO_BUTTON

No knowledge components have been assigned

A rotation of the wheel of Javier's wheelbarrow has the same length as the circumference of a circle. We know that the radius of the circle is equal to 6 inches. So, what is the circumference of the wheel?
Answers: (Interface Type: RADIO_BUTTON)
✗ 6π
✓ **12π**
✗ 12
✗ 36

Hint 1:
The formula for finding the circumference of a circle of radius r is 2πr.
Hint 2:
In our case the radius is equal to 6, so the answer is 2π*6=12π.

(Problem ID: 15228) RADIO_BUTTON

No knowledge components have been assigned

Good. So how far will the wheel travel in 3 rotations?

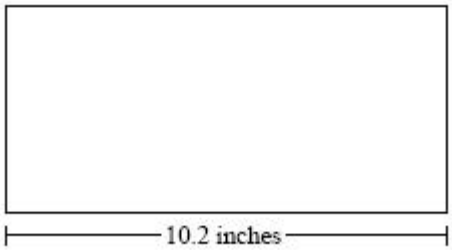
Answers: (Interface Type: RADIO_BUTTON)

✗ 6π
✗ 12π
✗ 36
✓ **36π**

Hint 1:
3 rotations of the wheel are equivalent to 3 times the circumference of the wheel.
Hint 2:
We know that circumference of the wheel is 12π. Multiply this by 3 to get the answer.
Hint 3:
Length traveled = 3*length of circumference = 3*12π. Therefore the answer is 36π.

44.) "autumn2001-23" (Problem ID: 15229) RADIO_BUTTON

No knowledge components have been assigned



The rectangle shown in the picture has an area of 51 square inches and a length of 10.2 inches. What is the perimeter of the rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✗ 20.2 inches
✗ 15.2 inches
✗ 40.8 inches
✓ **30.4 inches**

(Problem ID: 15230) RADIO_BUTTON

No knowledge components have been assigned

In order to determine the perimeter of the rectangle we must first calculate the width. What is the width of the rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✓ **5 inches**
✗ 10 inches
✗ 15.2 inches
✗ 40.8 inches

Hint 1:
The area of a rectangle of length L and width w is Lw. In other words, solve the following equation: Area = Lw.
Hint 2:

In our case we know that the area is 51 and the length is 10.2 and we want to find out the width.
Hint 3:
Solve the equation 51 = 10.2 * width to get the answer.
Hint 4:

$$51 = 10.2 \times width$$

$$\frac{51}{10.2} = \frac{10.2 \times width}{10.2}$$

$$5 = width$$

Please review the solution to the equation above. The answer is 5 inches.

(Problem ID: 15231) RADIO_BUTTON

No knowledge components have been assigned

Good. So now that we know the width and the length of the rectangle, what is the perimeter?

Answers: (Interface Type: RADIO_BUTTON)

✗ 20.2 inches
✗ 40.8 inches
✓ **30.4 inches**
✗ 15.2 inches

Hint 1:
The perimeter of a rectangle of length L and width w is 2(L+w). So, solve the following equation: Perimeter = 2(L+w).
Hint 2:
We know the length L is 10.2 and the width w is 5. Substitute these values in the equation above to find the perimeter.
Hint 3:
Perimeter = 2(10.2 + 5). simplify this expression to get the answer.
Hint 4:
Perimeter = 2(10.2 + 5)
Perimeter = 2 * 15.2
Perimeter = 30.4
Therefore the answer is 30.4 inches.

45.) "autumn2001-24" (Problem ID: 15232) RADIO_BUTTON

No knowledge components have been assigned

The distance from Boston, Massachusetts to Princeton, New Jersey is approximately 418 kilometers. What is the approximate distance in miles between Boston and Princeton? (1 mile = 1.609 kilometers)

Answers: (Interface Type: RADIO_BUTTON)

✗ 160 miles
✓ **260 miles**
✗ 500 miles
✗ 670 miles

(Problem ID: 15233) RADIO_BUTTON

No knowledge components have been assigned

We know that 1.609 kilometers = 1 mile and we want to find out how many miles are in 418 kilometers. In other words we want to find x in 418 kilometers = x miles. We can set up a proportion with this information and find the desired value. Which of the proportion below applies in our case?

Answers: (Interface Type: RADIO_BUTTON)

✗ 1 / 1.609 = x / 1.609
✓ **1.609 / 418 = 1 / x**
✗ 1.609 / 418 = x / 1
✗ 418 / x = 1 / 2

Hint 1:
We know the following:
1.609 kilometers = 1 mile
418 kilometers = x miles
Hint 2:
The proportion will contain the term 1.609 km / 418 km.
Hint 3:
The right proportion is 1.609 / 418 = 1 / x.

(Problem ID: 15234) RADIO_BUTTON

No knowledge components have been assigned

Good. So what is the distance in miles Boston and Princeton?

Answers: (Interface Type: RADIO_BUTTON)

✗ 500 miles
✗ 670 miles
✓ **260 miles**
✗ 160 miles

Hint 1:
We need to find x from the proportion 1.609 / 418 = 1 / x.
Hint 2:
Another way to write the proportion above is by reversing the numerator with the denominator in both of the terms of the proportion.
Hint 3:
After reversing, we get 418 / 1.609 = x / 1. Find x.
Hint 4:
256.79 = x. The answer is approximately 260 miles.

46.) "autumn2001-33" (Problem ID: 15235) RADIO_BUTTON

No knowledge components have been assigned

What is the effect on the area of a circle if the radius of the circle is doubled?

Answers: (Interface Type: RADIO_BUTTON)

✗ The area is multiplied by 2.
✓ **The area is multiplied by 4.**
✗ The area is multiplied by 8.
✗ The area stays the same.

(Problem ID: 15236) RADIO_BUTTON

No knowledge components have been assigned

Let's start by remembering the formula for the area of a circle and then we will examine the effect of doubling the radius. What is the formula for the area of a circle of radius r?
Answers: (Interface Type: RADIO_BUTTON)
✗ πr
✓ **πr?**
✗ 2πr *No, this is the area for the circumference of a circle. Please try again*
✗ 4πr

Hint 1:
You can look in your reference sheet in order to find this formula.
Hint 2:
The formula for the area of a circle is πr?.

(Problem ID: 15238) RADIO_BUTTON

No knowledge components have been assigned
Good. What is the area of a circle if we double the radius?
Answers: (Interface Type: RADIO_BUTTON)
✗ 4πr
✓ **4πr?**
✗ πr
✗ πr?

Hint 1:
We found that the area of a circle is πr?. Substitute r with 2r to get the answer.
Hint 2:
New area = π(2r)?. Solve this equation to find the value of the new area.
Hint 3:
New Area= π(2r)?
New Area = π2?r?
New Area = 4πr?.
Therefore the answer is 4πr?.

(Problem ID: 15237) RADIO_BUTTON

No knowledge components have been assigned
Great. So what is the effect on the area of a circle if the radius of the circle is doubled?
Answers: (Interface Type: RADIO_BUTTON)
✗ The area stays the same.
✓ **The area is multiplied by 4.**
✗ The area is multiplied by 2.
✗ The area is multiplied by 8.

Hint 1:
How does 4πr? compate to πr??
Hint 2:
Simplify 4πr? / πr? to get the answer.
Hint 3:
You can cancel out the term πr? from 4πr? / πr?.
Hint 4:
4πr? / πr? = 4. Therefore the area is multiplied by 4.

47.) "autumn2006 - 3" (Problem ID: 21880) ALGEBRA_FIELD

No knowledge components have been assigned

Ages of 15 Exercise Class Students

1	5 7 8
2	0 2 4 7
3	1 1 2 3 7
4	1 6
5	0

Key
1 | 9 represents 19

The stem-and-leaf plot above shows the ages, in years, of 15 students when they arrived on the first day of an exercise class. One additional student arrived later that day. Then the range of the student ages, including the age of the additional student, was 50 years.

What was the age, in years, of the additional student?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **65**

(Problem ID: 21881) ALGEBRA_FIELD

No knowledge components have been assigned

The range is defined as the distance between the largest and the smallest numbers in the data.

What is the current range of our data set, disregarding the additional student?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **35**

Hint 1:

You have to look at the stem-and-leaf plot and subtract the smallest age from the largest age of the students in the class to get the range.

Hint 2:

Ages of 15 Exercise Class Students

1	5 7 8
2	0 2 4 7
3	1 1 2 3 7
4	1 6
5	0

Key
1 | 9 represents 19

The smallest age is 15 , while the largest age is 50 . Please look at the figure to see how the stem-and-leaf plot was used to determine these values.

Hint 3:

The range is equal to the largest value minus the smallest value. In our case, it is equal to 50 - 15 = 35. The answer is 35.

(Problem ID: 21882) ALGEBRA_FIELD

No knowledge components have been assigned

Good. We know that our range without the additional student is equal to 35. When the additional student joins the class, the range becomes 50. What is the age, in years, of the additional student?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **65**

Hint 1:

The range before we get the new student is 35 but the range we need is 50. We need to increase the range by 50 - 35 = 15. Therefore the age of the new person must **either** be **15 years younger** than the current youngest or **15 years older** than the current oldest student.

Hint 2:

If the new student is 15 years younger than the youngest student he would be 15 - 15 = 0 years old and this does not make sense.

Hint 3:

Therefore the new student must be 15 years older than the oldest student. That is 50 + 15 = 65.

Hint 4:

So now we have an oldest student who is 65 years old and a youngest student who is 15 years old so the range is 65 - 15 = 50 which is what we want.

The new students age is 65 years. Please enter 65.

48.) "autumn2006 - 15" (Problem ID: 21883) ALGEBRA_FIELD

No knowledge components have been assigned

Number of People Who Ate Lunch

Day	Number of People
Monday	30
Tuesday	55
Wednesday	60
Thursday	30
Friday	75

Cindy is the manager of a restaurant. She recorded the number of people who ate lunch at the restaurant each day for 5 days, as shown in the table above. What is the mean number of people per day who ate lunch at the restaurant for those 5 days?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **50**

(Problem ID: 21886) ALGEBRA_FIELD

No knowledge components have been assigned

The mean of a collection of numbers is their arithmetic average, computed by adding them up and dividing by their number. What is the sum of the number of people who ate at the restaurant for 5 days?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **250**

Hint 1:

Number of People Who Ate Lunch

Day	Number of People
Monday	30
Tuesday	55
Wednesday	60
Thursday	30
Friday	75

To obtain the answer, add the numbers for each day in the table, as shown in the figure above.
Hint 2:
Sum = 30 + 55 + 60 + 30 + 75. Find the sum.
Hint 3:
Sum = 30 + 55 + 60 + 30 + 75 = 250. The answer is 250.

(Problem ID: 21887) ALGEBRA_FIELD

No knowledge components have been assigned
Good. Now that we know the sum of the number of people who ate in the restaurant for the 5 days, what is the mean number of peeple who ate in the restaurant for those 5 days?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **50**

Hint 1:
To find the mean, you have to divide the sum of the number of people who ate at the restaurant by the number of days.
Hint 2:
Mean = Sum / Number of days. Knowing that the sum is equal to 250 and the number of days is equal to 5, solve the equation to find the mean.
Hint 3:
Mean = Sum / Number of days = 250 / 5 = 50. The answer is 50.

49.) "autumn2006 - 22" (Problem ID: 21890) RADIO_BUTTON

No knowledge components have been assigned

Student Height Tally

Height (in inches)	Number of Students
58	/
63	/
66	//
67	𝍸
68	//
69	///
70	///
71	////
73	//

Ann and the other students in her mathematics class took turns measuring each other's heights. They rounded the measurements to the nearest inch and tallied them in the chart below. Based on the data

in the chart, what is the mode of the student heights in Ann's class?
Answers: (Interface Type: RADIO_BUTTON)
✓ **67 inches**
✗ 73 inches
✗ 68 inches
✗ 69 inches

(Problem ID: 21891) ALGEBRA_FIELD

No knowledge components have been assigned

The mode is the most frequently occurring value in the data set. Which height value in inches is the most frequent in the given data set?
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **67**

Hint 1:

Student Height Tally

Height (in inches)	Number of Students
58	/
63	/
66	//
67	𝍸
68	//
69	///
70	///
71	////
73	//

In order to find the most frequent height value, look in the given table above to determine which height has the maximum corresponding number of students.

Hint 2:

Student Height Tally

Height (in inches)	Number of Students
58	/
63	/
66	//
67	𝍸
68	//
69	///
70	///
71	////
73	//

Please look at that figure above to see which height value has the most markings in the number of students field.

Hint 3:

We notice that the maximum value of students having the same height is 5. They all have a height of 67 inches, therefore the most frequent height value is 67. The correct answer is 67.

(Problem ID: 21894) RADIO_BUTTON

No knowledge components have been assigned

Good. Now we know that the most frequent height value in the data set is 67 inches. So what is the mode of the student heights in Ann's class?

Answers: (Interface Type: RADIO_BUTTON)

✗ 73 inches
✗ 69 inches
✓ **67 inches**
✗ 68 inches

Hint 1:
The mode is the most frequently occurring height value in the data set.
Hint 2:
We know that most frequently occurring height value in the data set is 67 inches. What is the mode?
Hint 3:
The mode is 67 inches.

50.) "autumn2006 - 29" (Problem ID: 21896) RADIO_BUTTON

No knowledge components have been assigned

11, 11, 15, 22

Cheryl's scores on 4 quizzes are shown above. She calculated the mean, median, mode, and range of her 4 quiz scores. Cheryl's score was 13 on a 5th quiz. She then calculated the mean, median, mode, and range of her 5 quiz scores. Which of the following measures decreased in value when she included the 5th quiz score?

Answers: (Interface Type: RADIO_BUTTON)

✓ **mean**
✗ median *This is not correct. The median is the middle value of a set of values. In our case, the median before adding the 5th quiz was the middle value of (11, 11, 15, 22), which can be found by finding the average of the 2 middle values (11 + 15) / 2 = 13. The median after adding the 5th quiz can be found by finding the middle value of the data set (11, 11, 13, 15, 22), which is 13. Therefore, the value of the median did not decrease.*
✗ mode *This is not correct.The mode is the most frequently occurring value in the data set. In our case, the mode is 11 and it does not change when adding the value of the 5th quiz, since 13 will only appear once in the data set.*
✗ range *This is not correct. The range is the distance between the largest and the smallest numbers in the data. Since adding 13 will not affect the largest or the smallest values in the data set, the range will not change.*

51.) "autumn2006 - 32" (Problem ID: 21898) RADIO_BUTTON

No knowledge components have been assigned

Bottles Collected per Person

Name	Dmitri	Gary	Priscilla	Sonia
Number of Bottles	14	20	6	32

Dmitri, Gary, Priscilla, and Sonia collected bottles last week for recycling. The table above shows

the number of bottles each of them collected. They want to display the number of bottles each of them collected as a percent of the total number of bottles collected. Which of the following is the most appropriate type of data display for them to use?

Answers: (Interface Type: RADIO_BUTTON)

✗ stem-and-leaf plot *This is not correct. Below is an example of what a stem-and-leaf plot looks like. Since we are we are interested in displaying percentages in our case, this is not applicable.*

✗ box-and-whisker plot *This is not correct. Below is an example of what a box-and-whisker plot looks like, Since we are interested in displaying the number of bottles collected by each individual person as a percent of the total number of bottles collected, this graph is not applicable.*

✓ **circle graph**

✗ scatterplot *This is not correct. Below is an example of what a scatterplot looks like. Since a scatter plot needs two numbers for each data point and we only have one number and a name, it is not possible to make a scatter plot from this data.*

52.) "march2006 - 2" (Problem ID: 22753) RADIO_BUTTON

No knowledge components have been assigned

Normal Daily Maximum Temperatures for January

City	Temperature (°F)
Albany, NY	31.1
Boston, MA	36.5
Bridgeport, CT	36.9
Buffalo, NY	31.1
Burlington, VT	26.7
Concord, NH	30.6
Harrisburg, PA	37.5
Hartford, CT	34.1
Newark, NJ	38.1
Worcester, MA	31.4

Cynthia gathered temperature data for her social studies report. In the table above, she listed the normal daily maximum temperatures for January in several different cities. What is the range of the normal daily maximum temperatures listed in the table?

Answers: (Interface Type: RADIO_BUTTON)

✓ **11.4**

✗ 32.8

✗ 0.3

✗ 31.1

(Problem ID: 22734) ALGEBRA_FIELD

No knowledge components have been assigned

The range is defined as the distance between the largest and the smallest numbers in the data. What is the largest temperature in our table?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **38.1**

Hint 1:

Look in the table with the temperature data above and choose the maximum temperature

value from the given data values.
Hint 2:

Normal Daily Maximum Temperatures for January

City	Temperature (°F)
Albany, NY	31.1
Boston, MA	36.5
Bridgeport, CT	36.9
Buffalo, NY	31.1
Burlington, VT	26.7
Concord, NH	30.6
Harrisburg, PA	37.5
Hartford, CT	34.1
Newark, NJ	38.1
Worcester, MA	31.4

The maximum temperature value is 38.1. See the figure above.
Please enter 38.1

(Problem ID: 22735) ALGEBRA_FIELD

No knowledge components have been assigned
Good. Now using the same rationale, what is the minimum temperature in our dataset?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **26.7**

Hint 1:
Look in the table with the temperature data above and choose the minimum temperature value from the given data values.
Hint 2:

Normal Daily Maximum Temperatures for January

City	Temperature (°F)
Albany, NY	31.1
Boston, MA	36.5
Bridgeport, CT	36.9
Buffalo, NY	31.1
Burlington, VT	26.7
Concord, NH	30.6
Harrisburg, PA	37.5
Hartford, CT	34.1
Newark, NJ	38.1
Worcester, MA	31.4

The minumum temperature value is 26.7. See the figure above.
Please enter 26.7

(Problem ID: 22736) RADIO_BUTTON

No knowledge components have been assigned

Great. We know that the range is defined as the distance between the largest and the smallest numbers in the data. What is the range of the temperatures listed in the table?

Answers: (Interface Type: RADIO_BUTTON)

✗ 31.1
✓ **11.4**
✗ 32.8
✗ 0.3

Hint 1:
We know the maximum temperature is 38.1 and the minumum temperature is 26.7. The range is the difference between these values.

Hint 2:
Range = maximum temperature - minimum temperature
Range = 38.1 - 26.7
What is the value of the range?

Hint 3:
Range = 38.1 - 26.7
Range = 11.4
The answer is 11.4. Please select 11.4

53.) "march2006 - 23" (Problem ID: 22754) ALGEBRA_FIELD

No knowledge components have been assigned

Recorded Car Speeds

4	9
5	1 2 5 7 7 7 8
6	0 1 8 9
7	2 4 5

Key
5 | 3 represents 53

The stem-and-leaf plot below shows the recorded speeds, in miles per hour, of the first 15 cars that passed a police officer on a Friday. The police officer issued a ticket to the driver of each car whose recorded speed was greater than 65 miles per hour. Based on the data in the stem-and-leaf plot, what was the total number of tickets the police officer issued?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **5**

(Problem ID: 22755) ALGEBRA_FIELD

No knowledge components have been assigned

Let us look at the stem-and-leaf plot. How many drivers had a speed greater than 65 miles per hour and were therefore given a ticket?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **5**

Hint 1:

Recorded Car Speeds

4	9
5	1 2 5 7 7 7 8
6	0 1 8 9
7	2 4 5

Key
5 | 3 represents 53

Look at the stem-and-leaf plot above - how many drivers had a speed greater than 65 miles per hour?
Hint 2:
The values above 65 miles recorded were 68, 69, 72, 74, 75. So, how many values above 65 miles per hour were recorded?
Hint 3:
The answer is 5. Please enter 5.

54.) "spring 2006 - 30" (Problem ID: 22756) RADIO_BUTTON

No knowledge components have been assigned

Vehicles at Dealership

	Number of Cars	Number of Vans	Number of Trucks
New	4	7	9
Used	36	21	23

A local car dealership has 100 vehicles on its lot. The chart below shows the numbers of cars, vans, and trucks, both new and used. Based on the chart, what percent of the 100 vehicles are either new cars or new trucks?
Answers: (Interface Type: RADIO_BUTTON)
✗ 11%
✓ **13%**
✗ 20%
✗ 59%

(Problem ID: 22757) ALGEBRA_FIELD

No knowledge components have been assigned

In order to find the percentage of new cars and trucks, we must first find their number. What is the number of new cars and trucks?
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **13**

Hint 1:

Vehicles at Dealership

	Number of Cars	Number of Vans	Number of Trucks
New	4	7	9
Used	36	21	23

Please look at the figure above - there are 2 red boxes showing the number of new cars and

the number of new trucks .
Hint 2:
The number of new cars is 4 and the number of new trucks is 9 . Add these two number to obtain the number of new trucks and cars.
Hint 3:
The number of new cars and trucks is equal to 4 + 9 = 13. Please enter 13.

(Problem ID: 22758) RADIO_BUTTON

No knowledge components have been assigned
Good. Now, what percent of the 100 vehicles are either new cars or new trucks?
Answers: (Interface Type: RADIO_BUTTON)
✗ 20%
✓ **13%**
✗ 11%
✗ 59%

Hint 1:
We have 100 cars in total and we know that 13 of them are new cars or trucks. Find the percentage of new cars and trucks.
Hint 2:
Percentage of new cars and trucks = 13 / 100.
Hint 3:
Percentage of new cars and trucks = 13 / 100
Percentage of new cars and trucks = 13%
Please select 13%

End Linear Section
nd Linear Section

Home [FAQ]

Module Worksheet

Logout

Christopher Freeman

You are currently at: **Curriculum Pretty-Print**

Module Name: 10thGrade-CPF-Hints

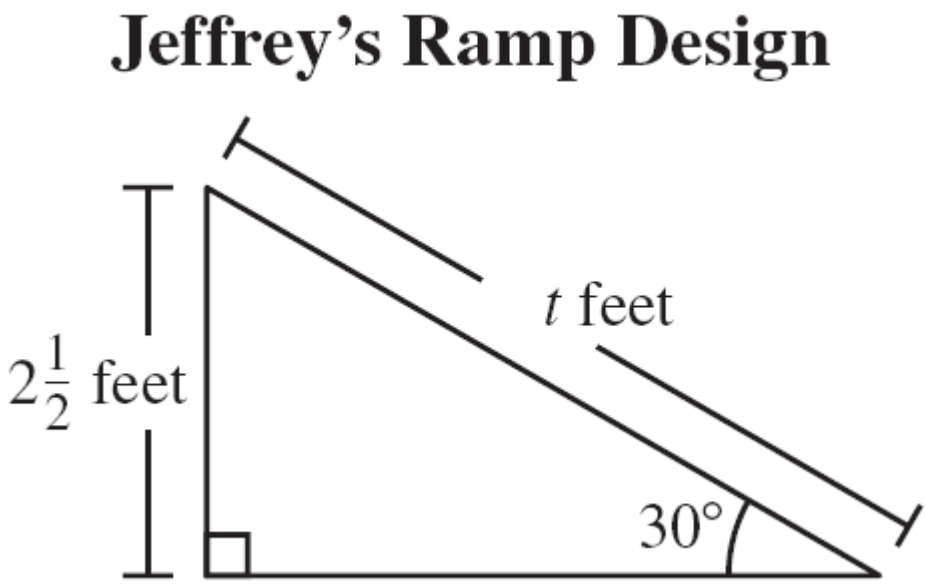
Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Linear Section

1.) "2006_16_gr10_nocalc_HINT" (Problem ID: 15479) TEXT_FIELD [MA - 2006 - SPRING - 16]

No knowledge components have been assigned



Jeffrey wants to build a ramp to make it easier to load his lawn mower into the back of his truck. He drew the diagram above to help him design the ramp. What is t, the length in feet of the ramp?

Answers: (Interface Type: TEXT_FIELD)

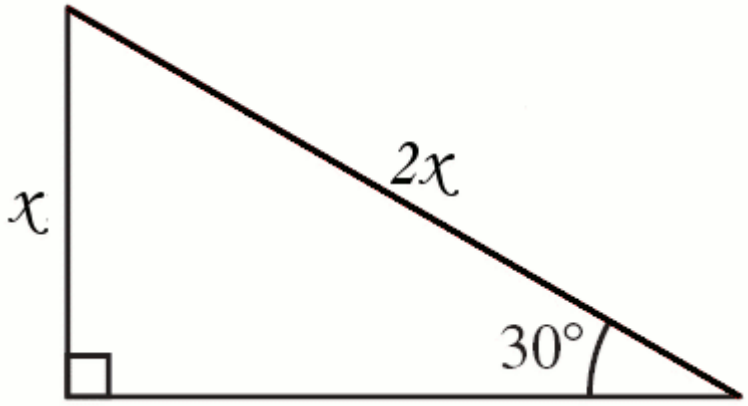
✓ **5**

Hint 1:

The figure above is a special right triangle called a 30-60-90 triangle. Using the properties of a 30-60-90 triangle, establish a relationship between the side we know (the side opposite the 30? angle) and the side we wish to know (the opposite the 90? angle)

Refer to your reference sheet for the relationships in a 30-60-90 triangle.

Hint 2:



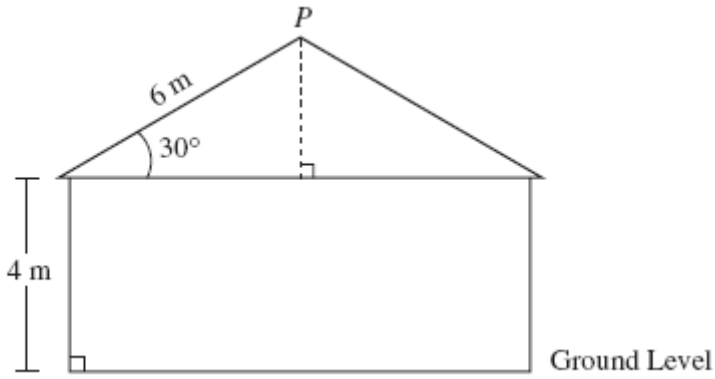
From the figure above, we can conclude that whatever the side opposite the 30? angle is, the hypotenuse (opposite the 90? angle) is going to be double.

Use this relationship to find t, the hypotenuse of the 30-60-90 triangle.
Hint 3:
t = 2 ? (2 1/2) = 5.

The value of t is 5

2.) "2005_29_gr10_calc_HINT" (Problem ID: 15482) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

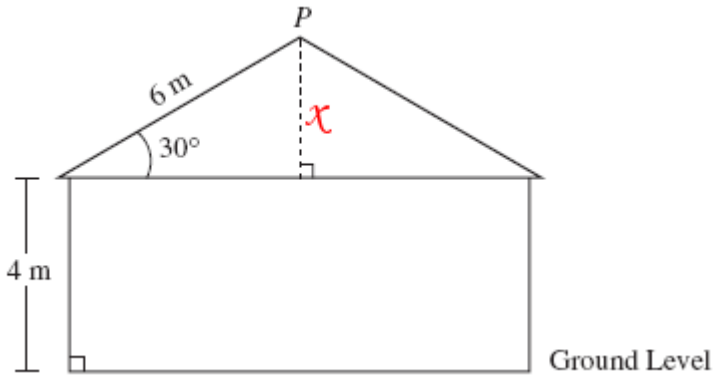
No knowledge components have been assigned



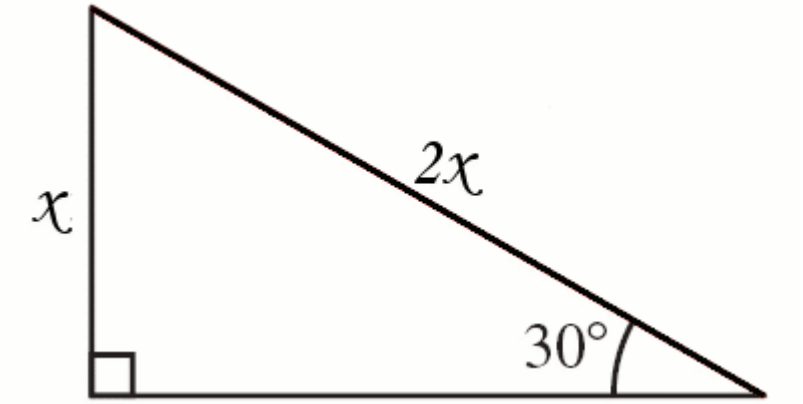
The diagram above show the side view of a house. The base of its roof is 4 meters above ground level.

Point P is the highest point on the roof. Based on the diagram, what is the distance from P to the ground level?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **7**

Hint 1:



To solve this problem, we are going to need to find the length of **x** (marked in the figure above) and add it to the rest of the height
Hint 2:
x makes up the side of a 30-60-90 triangle. Using the properties of a 30-60-90 triangle, establish a relationship between **x** and the known value of the hypotenuse, 6.
Hint 3:



From the figure above, we can conclude that the side opposite the 30? angle is half that of the hypotenuse.

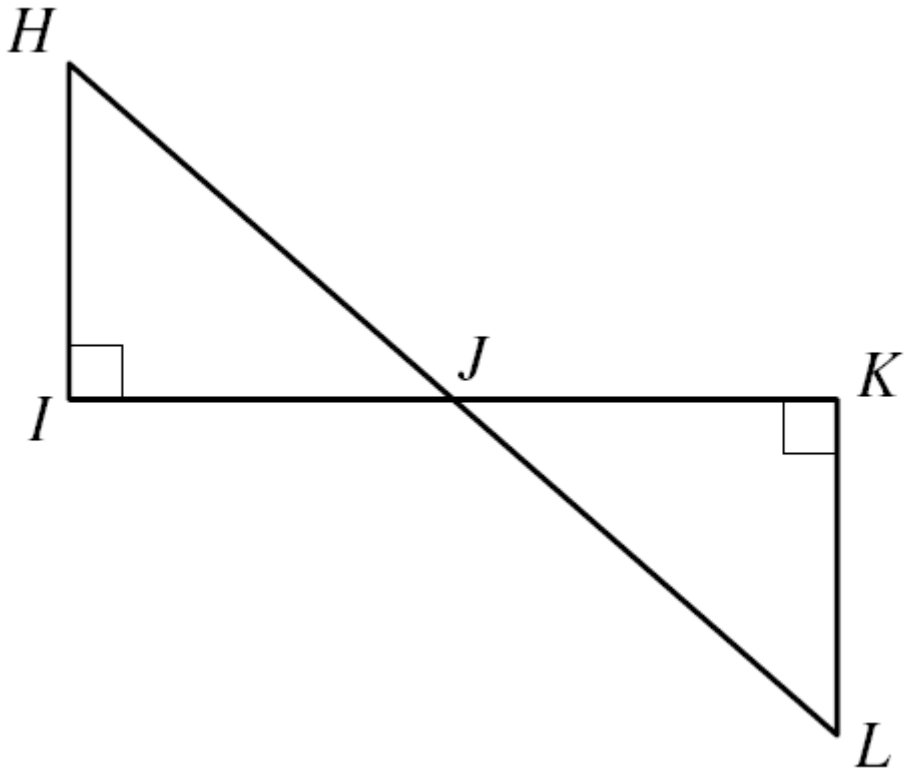
Now solve for x.
Hint 4:
6/2 = 3

Now add 3 to the rest of the height of the house. This will give us the full height of the house. This is the distance from P to the ground level.
Hint 5:
3 + 4 = 7

The answer is 7.

3.) "2005Nov_05_gr10_nocalc_HINT" (Problem ID: 15485) RADIO_BUTTON [MA - 2005 - NOV - 5]

No knowledge components have been assigned

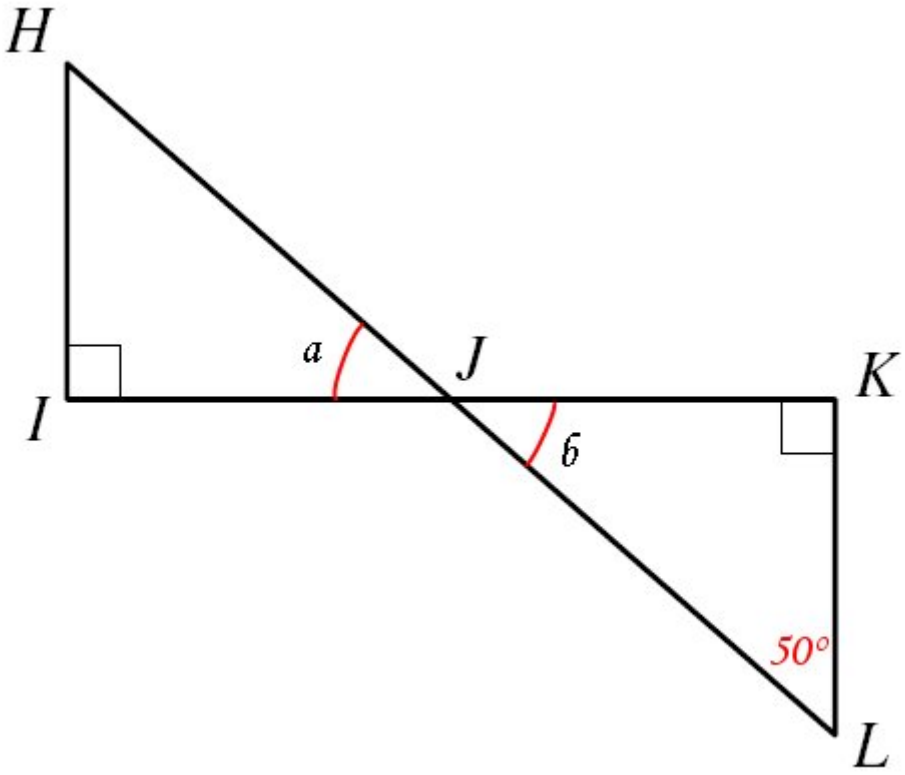


In the figure above, triangle HIJ is congruent to triangle LKJ. If the measure of angle L is 50 degrees, what is the measure of angle IJH?

Answers: (Interface Type: RADIO_BUTTON)

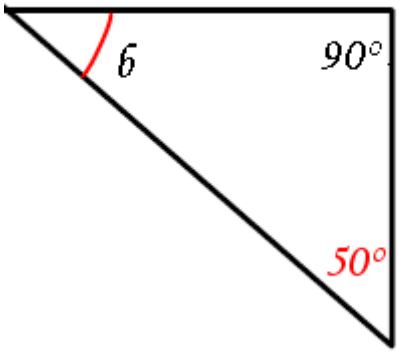
✗ A. 35
✓ **B. 40**
✗ C. 45
✗ D. 50

Hint 1:



It is always helpful to draw a sketch. Let's label the measure of angle L and add some other labels.

We need to find the measure of angle IJH, which we've labelled as **a**. First, we'll need to find the measure of angle KJL, labelled as **b**
Hint 2:



To find b, we can use the sum of the interior angles of a triangle.
Hint 3:
90 + 50 + b = 180
b = 40

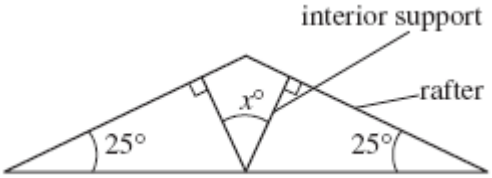
Now that we know b, let's find the measure of a.
Hint 4:

Angles a and b are *vertical angles* This means that they are equal.
Hint 5:
a = b and b = 40. So a = 40

a is the angle of IJH. So the answer is 40.

4.) "2005_38_gr10_calc_HINT" (Problem ID: 15489) RADIO_BUTTON [MA - 2005 - Spring - 38]

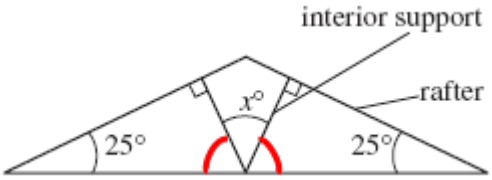
No knowledge components have been assigned



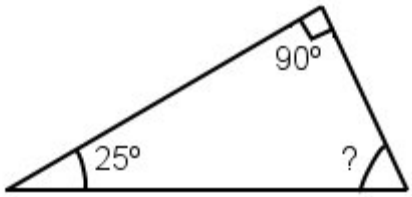
Each of the two interior supports for part of a roof is perpendicular to a rafter, as shown above.

Find x.
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 50**
✗ B. 65
✗ C. 90
✗ D. 130

Hint 1:



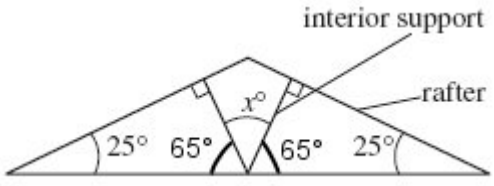
To find x, first find the angles marked in red.
Hint 2:



The sum of the interior angles of a triangle is 180. Use this fact to find the angles in red.
Hint 3:
For one of the angles in red,

25 + 90 + ? = 180
The angle is equal to 65
The red angles equal each other due to symmetry

Now we can find x.
Hint 4:



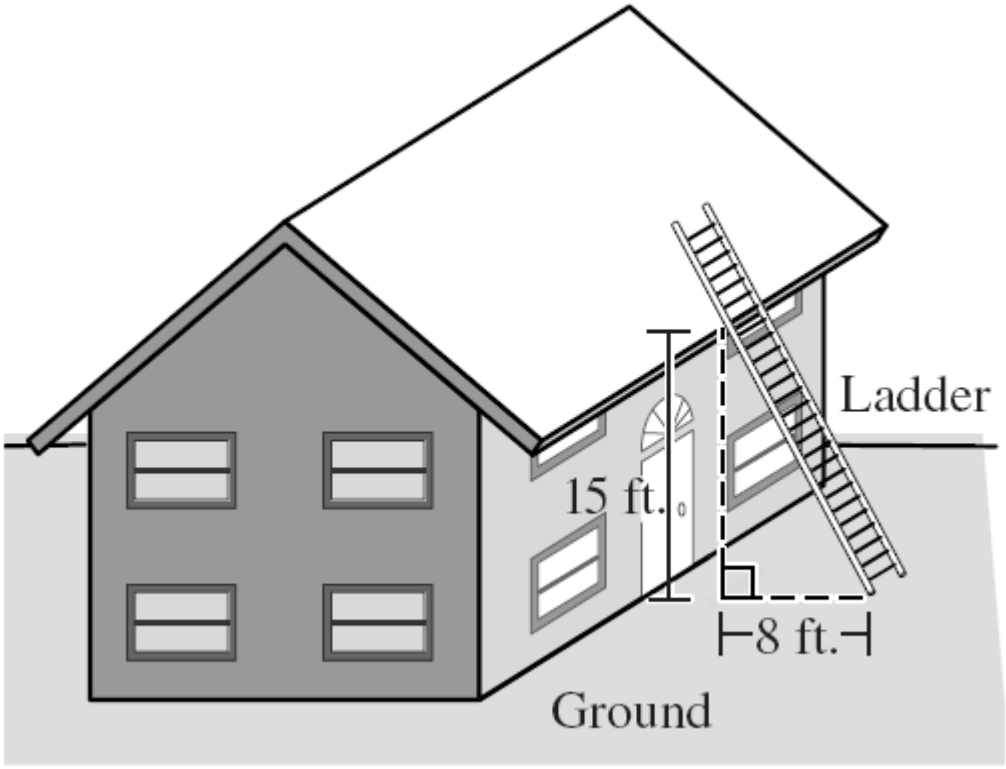
The sum of the angles that were found and x should equal 180.

65 + 65 + x = 180
Hint 5:
x = 180 - 65 - 65 = 50

The answer is 50.

5.) "2004_33_gr10_calc_HINT" (Problem ID: 15492) RADIO_BUTTON [MA - 2004 - Spring - 33]

No knowledge components have been assigned



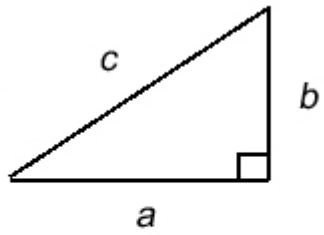
Using the measurements shown in the sketch, what is the length of the section of the ladder from the point where it rests on the ground to the point where it touches the house?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 4.8 ft

✗ B. 7 ft
✓ **C. 17 ft**
✗ D. 23 ft

Hint 1:



$a^2 + b^2 = c^2$

The section of the ladder from the point where it rests on the ground to the point where it touches the house makes up the hypotenuse of a right triangle.

Use the Pythagorean Theorem to setup an equation to solve for the distance of the hypotenuse. Refer to your reference sheet to find the Pythagorean Theorem or look at the image above.
Hint 2:
By substituting in our values:

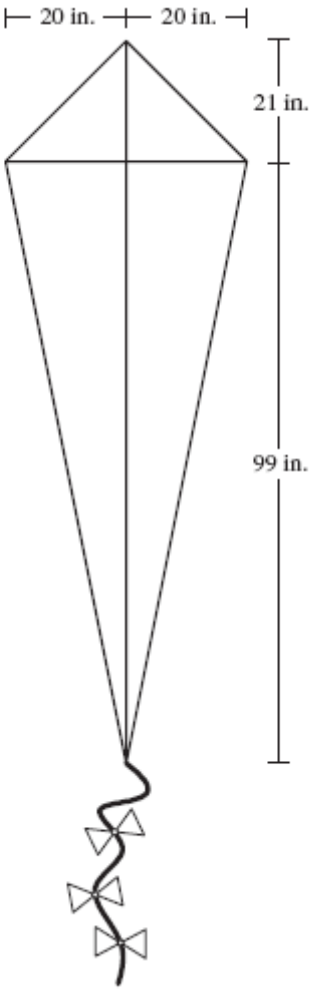
$8^2 + 15^2 = x^2$

Simplify and solve for x.
Hint 3:
Evaluate the exponents first.

$64 + 225 = x^2$ $289 = x^2$
Hint 4:
The square root of 289 is 17. The answer is 17 ft.

6.) "2005_32_gr10_calc_HINT" (Problem ID: 15495) ALGEBRA_FIELD [MA - 2005 - Spring - 32]

No knowledge components have been assigned



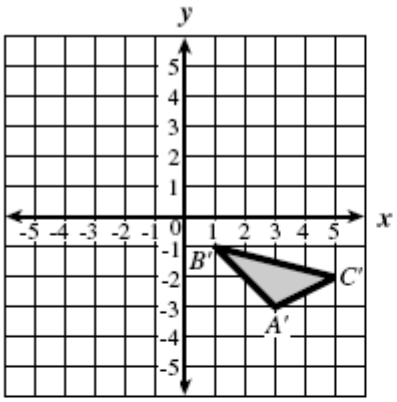
A kite has perpendicular diagonals with the measures shown in the drawing above.

What is the perimeter, in inches of the kite?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **260**

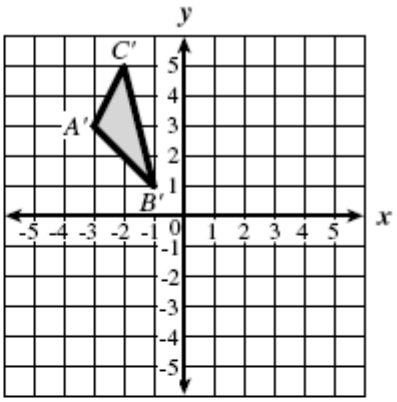
7.) "2005Nov_26_gr10_calc_HINT" (Problem ID: 15500) RADIO_BUTTON [MA - 2005 - NOV - 26]

No knowledge components have been assigned

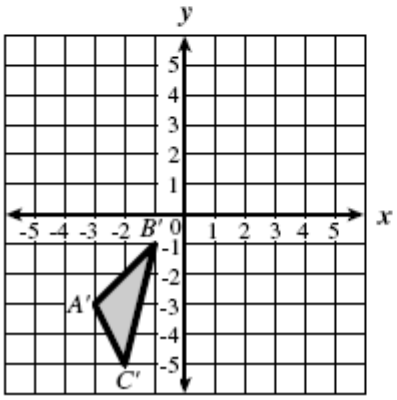
A.



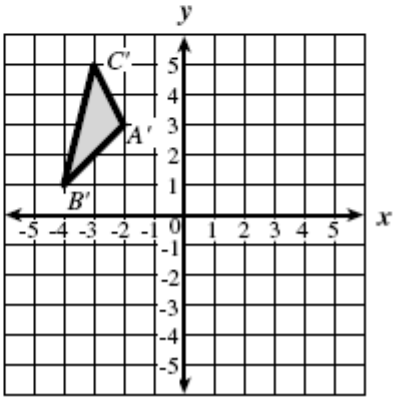
C.



B.



D.

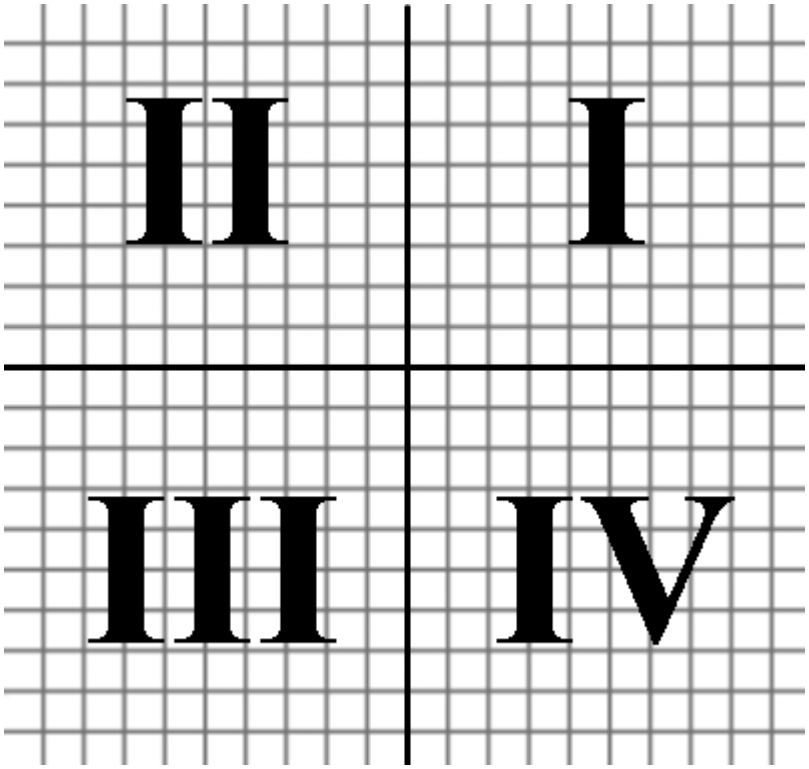


Triangle ABC has vertices at A(3,3), B(1,1), and C(2,5). In which of the graphs below is triangle A'B'C', a reflection of a triangle ABC over the y-axis?

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:



To figure out which answer choice represents A'B'C', let's first consider which quadrant ABC should be in.

Hint 2:

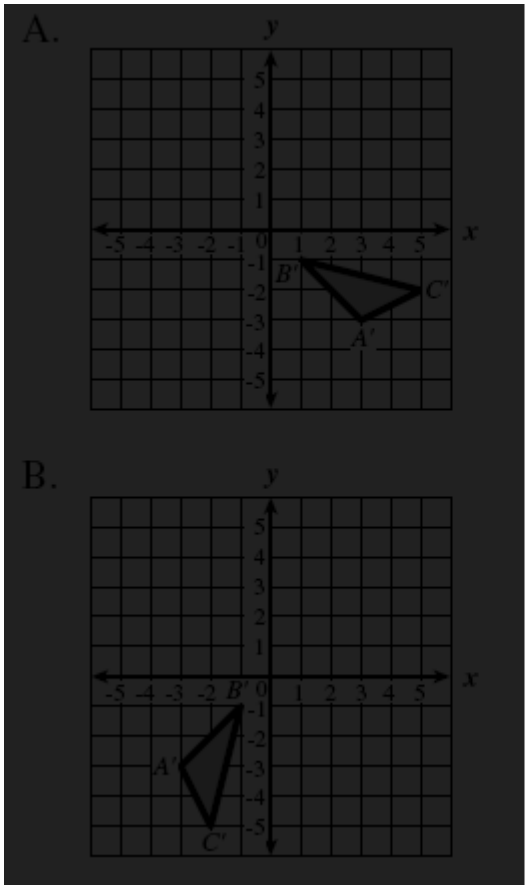
ABC, which has all positive coordinates should be in quadrant I. Which quadrant should A'B'C', the reflection of ABC across the y-axis, be in?

Hint 3:

One way to think about a reflection across the y axis is:

If the x-y graph was a piece of paper and we folded it with the y-axis being the crease. Which quadrant would touch Quadrant I?

Hint 4:



Quadrant II and Quadrant I should touch if the graph is folded across the y-axis.

A'B'C' should be in Quadrant II. This rules out two of our answer choices.
Hint 5:
Use graph or scrap paper and plot the points of ABC on the x-y plane.

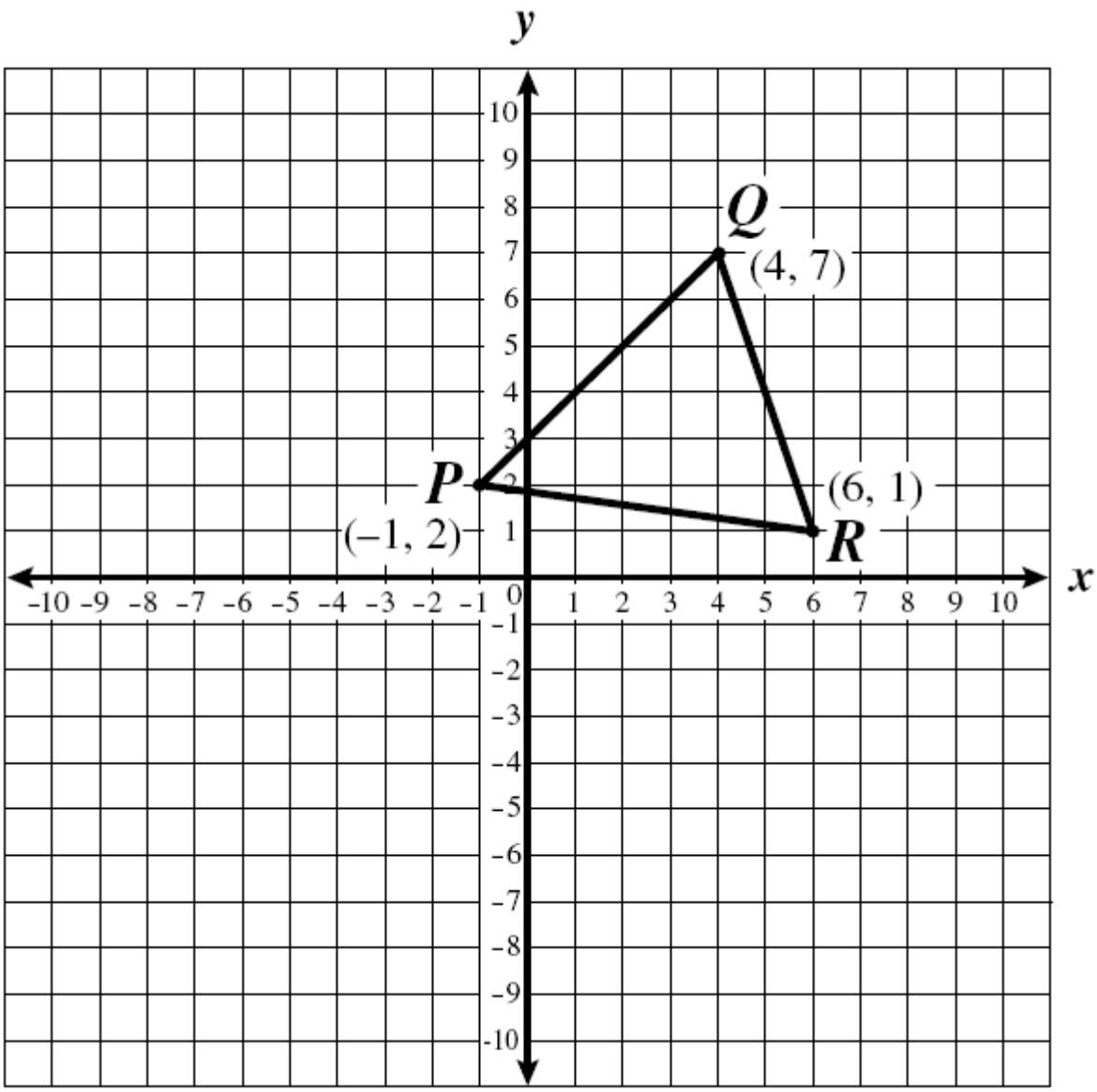
Consider each of the two possible choices. If you fold the paper with the crease being the y-axis, the triangles should line up perfectly.

Alternatively, ABC and A'B'C' should be symmetrical with respect to the y-axis.
Hint 6:
C fits the requirements. A'B'C' here is symmetrical with respect to ABC.

The answer is C.

8.) "2005Nov_18_gr10_nocalc_HINT" (Problem ID: 15504) RADIO_BUTTON [MA - 2005 - Spring - 18]

No knowledge components have been assigned



Sydney accurately sketched triangle P'Q'R', the reflection of triangle PQR across the x-axis. What are the coordinates of point Q' in triangle P'Q'R'?

Answers: (Interface Type: RADIO_BUTTON)

✗ D. (16, 49)

✗ A. (-4, -7)

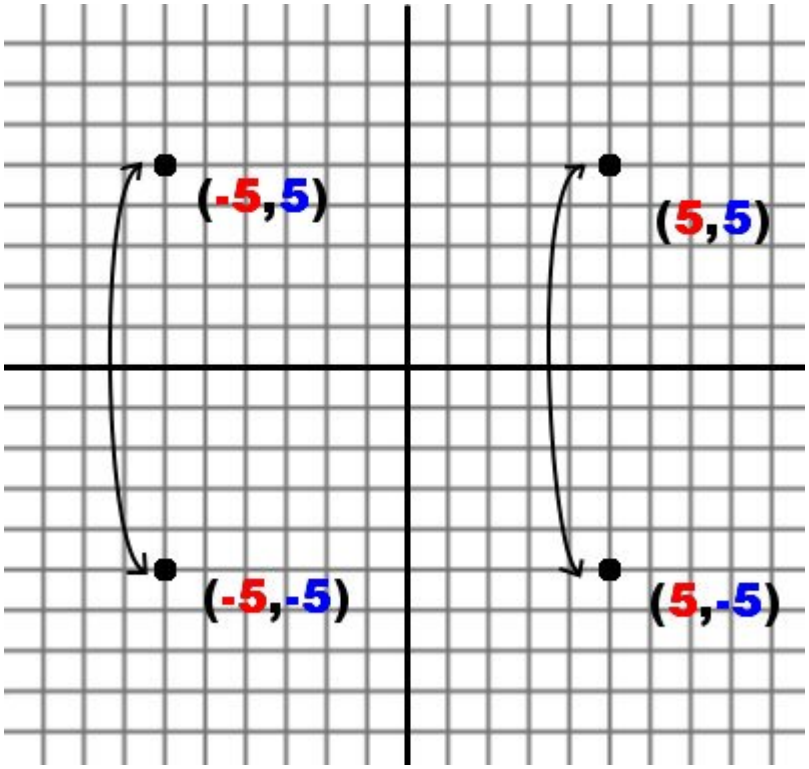
✓ **B. (4, -7)**

✗ C. (-4, 7)

Hint 1:

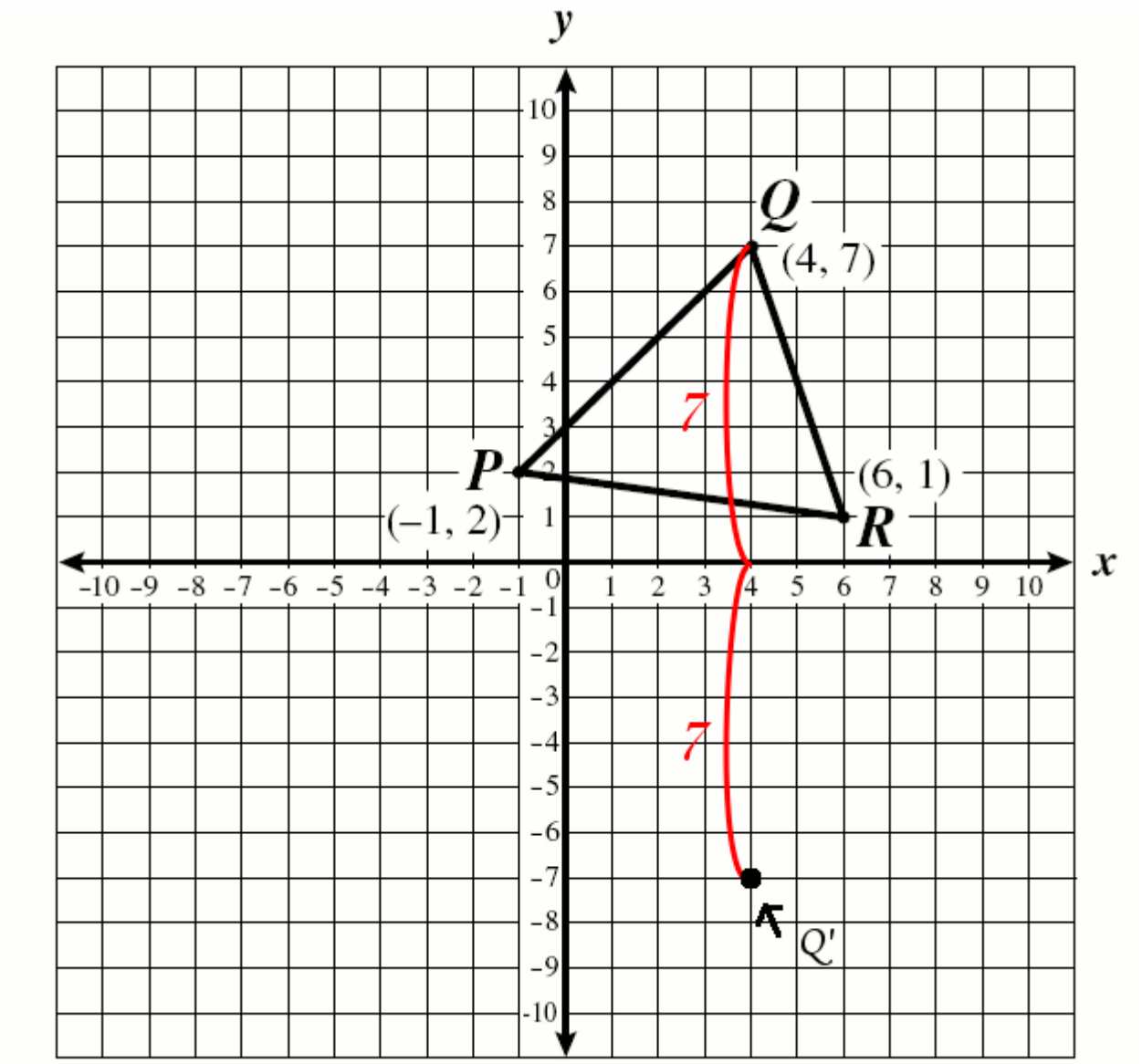
In order to find the point Q', we will need to figure out what happens to Q when it is reflected across the x-axis.

Hint 2:



Points reflected across the x-axis have their x-coordinate unchanged, but the y-coordinate is changed. In the y-direction, the distance from the point to the x-axis will be the same as its reflected point on the other side of the x-axis.

(Note: the x coordinate will stay the same (in red), but the y-coordinate changes)
Hint 3:



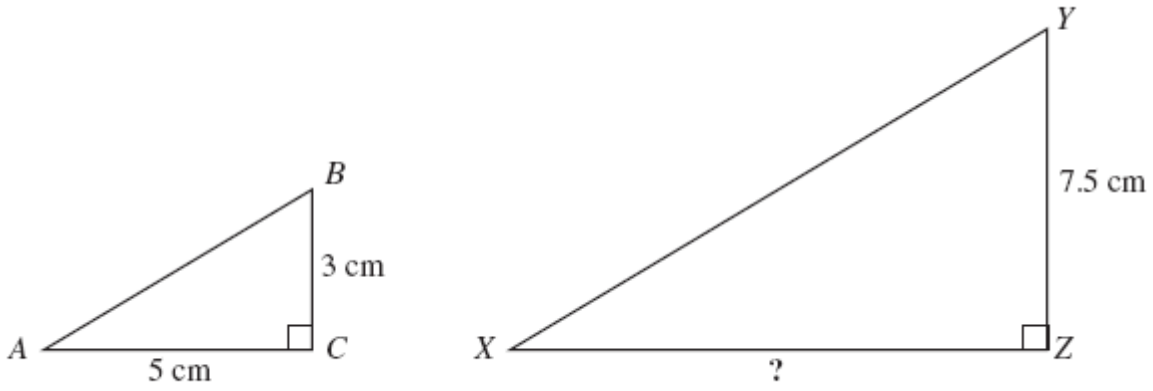
For Q, we notice the distance to the x-axis from Q is 7. So this must be true of Q'. We also know that the x-coordinate must stay the same.

Use the image above to find the coordinate of Q'
Hint 4:
Q' is at the coordinate (4, -7)

Please select answer choice B.

9.) "2004_25_gr10_HINT" (Problem ID: 15514) RADIO_BUTTON [MA - 2004 - Spring - 25]

No knowledge components have been assigned



In the picture shown above, triangle ABC is similar to XYZ.

What is the length of XZ?

Answers: (Interface Type: RADIO_BUTTON)

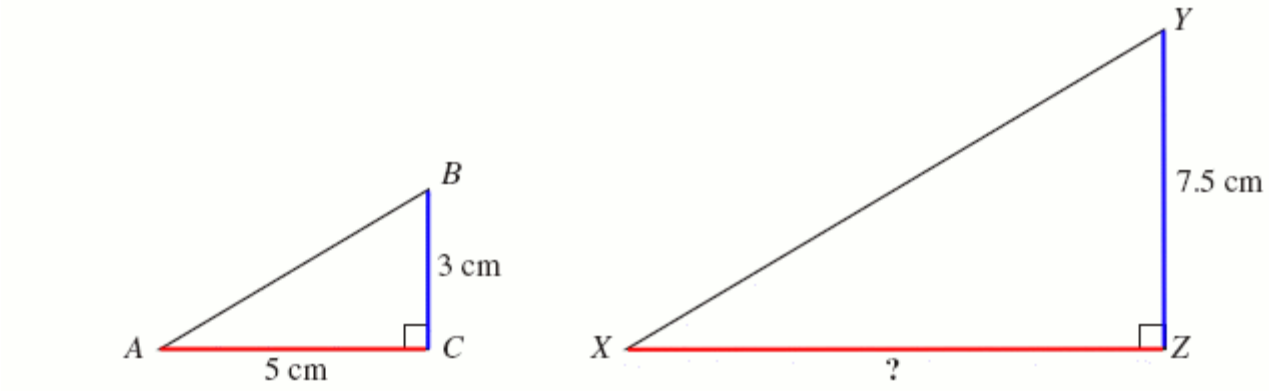
✗ A. 2.0 cm

✗ B. 4.5 cm

✓ **C. 12.5 cm**

✗ D 22.5 cm

Hint 1:



To find the length of XZ, we will use the fact that ABC and XYZ are similar. First, determine the relationship between the corresponding sides of the two triangles.

Hint 2:

We will need to set up a ratio between the corresponding sides. Try the long blue line over the smaller blue as a ratio. Set this equal to the long red line over the smaller red line.

Hint 3:

$$\frac{7.5}{3} = \frac{XZ}{5}$$

The equation above represents the ratios of corresponding sides being set equal to each other.

We can use this ratio to solve for XZ. Start by multiplying both sides by 5.

Hint 4:

XZ = 5(7.5)/3 = 12.5

The answer is 12.5

End Linear Section
End Linear Section

Module Name: 10thGradeMZ-BT-Hint

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Random Order Section

1.) "2001.11.10.geo.h" (Problem ID: 14855) TEXT_FIELD

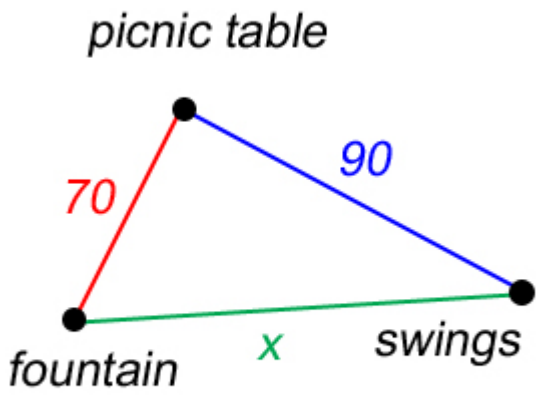
No knowledge components have been assigned

In Oak Park, a picnic table is located 70 feet from the water fountain and 90 feet from the swings. What is the longest possible distance that the water fountain could be from the swings?

Answers: (Interface Type: TEXT_FIELD)

✓ **160**

Hint 1:

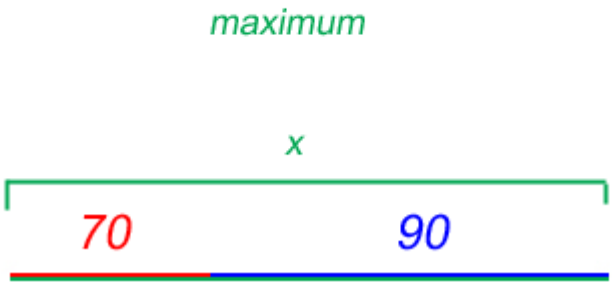


Start by drawing a picture! In this question, there are three locations: the picnic table, the water fountain, and the swings.

If we think of each location as a corner of a triangle, then we have the lengths of two sides of the triangle, 70 and 90.

Let the third side represent the distance from the water fountain to the swing.

Hint 2:



Take a look at the animation above.
The red length represents the distance from the picnic table to the water fountain.
The blue length represents the distance from the picnic table to the swings.
The green length represents the distance from the water fountain to the swings.
Hint 3:
As you can see, the green length reaches its maximum length when the red and blue lengths are put end to end.
Hint 4:
The maximum length of the green line is the sum of the red and blue segments.
Hint 5:
The maximum distance from the water fountain to the swings is 70 + 90.
Hint 6:
70 + 90 = 160
Type in 160.

2.) "2002.40.10.me.h" (Problem ID: 15409) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned

What is the effect on the circumference of a circle if the circle's radius is doubled?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. The circumference is multiplied by 2**
✗ B. The circumference is multiplied by 4
✗ C. The circumference is multiplied by 8
✗ D. The circumference stays the same

Hint 1:
To solve this problem, find the ratio between the doubled-radius circumference and the normal circumference.

The formula for the circumference of a circle is:
$C = 2\pi r$
You can also refer to your reference sheet for the formula for the circumference of a circle.
Hint 2:
Find the circumference of a circle whose radius is doubled by substituting the **r** in the formula for the circumference of a circle with **2r**.
Hint 3:
The formula for the circumference of a circle whose radius is doubled is:
$C = 4\pi r$
Hint 4:

$$ratio = \frac{4\pi r}{2\pi r}$$

$$ratio = \frac{4\cancel{\pi}\cancel{r}}{2\cancel{\pi}\cancel{r}}$$

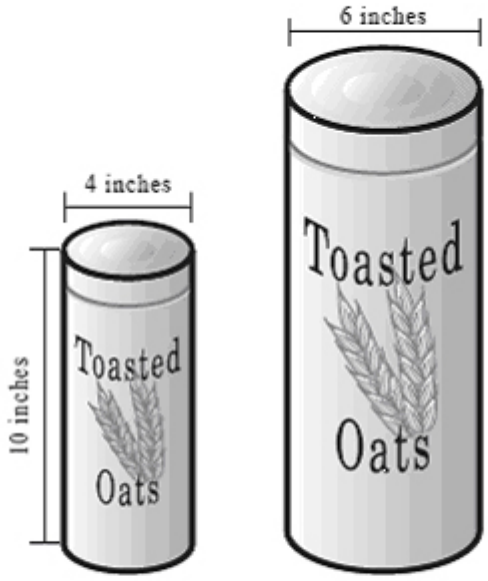
$$ratio = \frac{4}{2}$$

Ratio = 2
Since the ratio is 2, the effect of doubling the radius on the circumference of a circle is **A. The circumference is multiplied by 2**
Hint 5:
false

3.) "2002.4.10.h" (Problem ID: 15417) RADIO_BUTTON [MA - 2002 - SPRING - 4]

No knowledge components have been assigned

A company packages breakfast cereal in the two sizes of right cylindrical containers shown below. The containers are similar in shape.



How many cubic inches does the large container hold?

A. 90π cubic inches

B. 135π cubic inches

C. 360π cubic inches

D. 540π cubic inches

Answers: (Interface Type: RADIO_BUTTON)

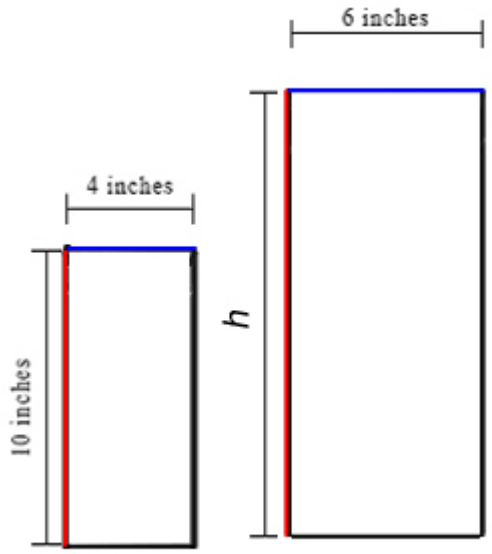
✔ **A**

✘ B

✘ C

✘ D

Hint 1:



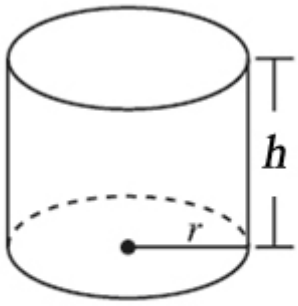
In order to find the volume of the large cylinder, first find the its height. To find the height, set up a ratio representing the relationship between the lengths of the sides of the cylinders and solve for the height.

The ratio between the width and height of the smaller cylinder is equal to the ratio of the width and height of the larger cylinder.
Hint 2:

$$\frac{4}{10} = \frac{6}{h}$$

The ratio between the width and height of the smaller cylinder is 4 / 10. The ratio between the width and height of the larger cylinder is 6 / h.

Solve the equation for the value of h, the height of the larger right cylinder.
Hint 3:



Volume of a Right Cylinder =

$$\pi r^2 * h$$

The height of the cylinder is 15.

Now solve for the volume of the right cylinder using the formula for the volume of a right cylinder.

Refer to your reference sheet for the formula for the volume of a right cylinder.
Hint 4:
The radius is half of the width which is 6 / 2 = 3. So, the volume of the cylinder is :
π * 3? * 15
Hint 5:
π * 9 * 15
The answer is 90 π Choose answer choice A.

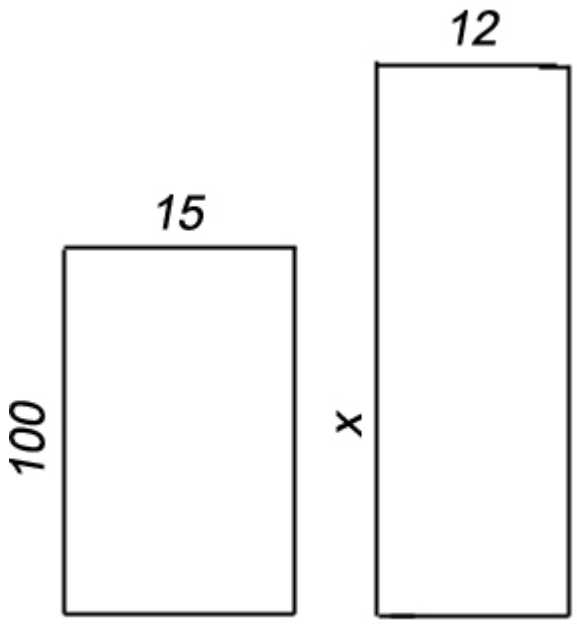
4.) "2002.re.29.10.me.h" (Problem ID: 15421) RADIO_BUTTON [MA - 2002 - FALL - 29]

No knowledge components have been assigned

Thomas is installing a 100-foot-long roll of a 15-foot-wide piece of carpet. Thomas located a roll of similar carpeting that was 12 feet wide. How many feet of the 12-foot-wide roll of carpeting does Thomas need to equal the area of the 15-foot-wide roll of carpeting?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 80 feet
✗ B. 112 feet
✓ **C. 125 feet**
✗ D. 154 feet

Hint 1:



The image above shows what we know about the dimensions of the two pieces of carpet. In order to solve this problem, use the fact that the two pieces of carpet need to have the same area.

Find the area of both of the carpets and set up an equation equating the two areas. Then solve for **x**, the length of the 12-foot wide carpet.
Hint 2:

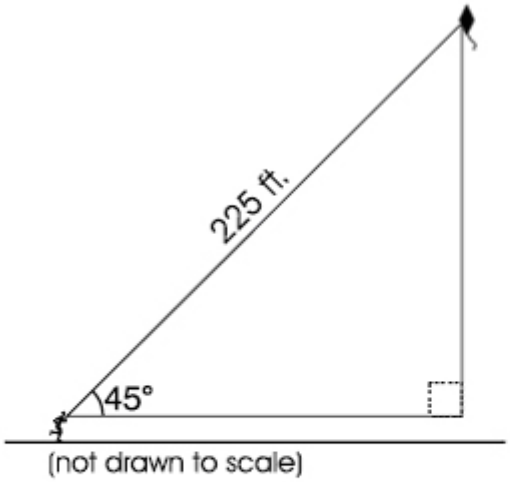
*Area of a Rectangle = width * length*

The equation for the area of a rectangle is shown above.
You can also refer to your reference sheet for the equation for the area of a rectangle.
Hint 3:
The equation equating the areas of the two carpets is:
12x = 1500
Hint 4:
12x / 12 = 1500 / 12
x = 1500 / 12
Hint 5:
x = 125 The length of the 12-foot wide carpet needs to be 125 feet. Choose answer choice C. 125 feet

---

5.) "2001.17.10.geo.h" (Problem ID: 15425) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned



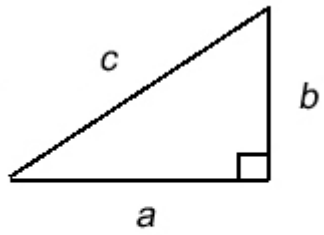
It is believed that the best angle to fly a kite is 45°. If you fly a kite at this angle and let out 225 feet of string, **approximately** how high above the ground will the kite be?

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 250 feet
✗ B. 200 feet
✓ **C. 150 feet**
✗ D. 100 feet

Hint 1:
This is a 45-45-90 triangle. If a right triangle has an angle of 45 degrees, then the third angle is also 45 degrees.

If a triangle has two angles of the same measure, it is an isosceles triangle. The sides opposite the congruent angles are also equal in length.

Now that we know the two legs of the triangle are congruent, we can solve for the kite's height.
Hint 2:



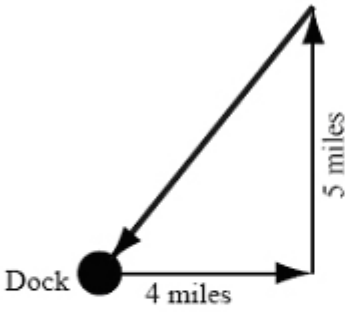
$a^2 + b^2 = c^2$

Since the triangle is a right triangle, we can use the Pythagorean Theorem.
Refer to your reference sheet for the Pythagorean Theorem.
Hint 3:
If we let **x** be the height of the kite, then the two legs are both of length x. The equation is:
225? = x? + x?
Hint 4:
50625 = x? + x?
50625 = 2x?
50625 / 2 = 2x? / 2
50625 / 2 = x?
x? = 25312.5
Now find which of the answer choices is closest to the square root of 15312.5.
Hint 5:
The square root of 15312.5 is approximately 159. The answer choice C. 150 feet is closest to 159.
Choose answer choice C.

6.) "2002.re.26.10.h" (Problem ID: 15429) RADIO_BUTTON [MA - 2002 - FALL - 26]

No knowledge components have been assigned

A boat traveled 4 miles due east away from a dock. Then it turned and traveled 5 miles due north. Finally, it turned again and traveled back to the dock as shown in the figure below.



Which of the following is closest to the total distance the boat traveled?

A. 12 miles

B. 13 miles

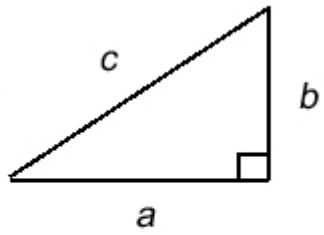
C. 15 miles

D. 18 miles

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:



$a^2 + b^2 = c^2$

Use the Pythagorean Theorem to setup an equation to solve for the distance of the hypotenuse, the distance traveled during the return trip. Refer to your reference sheet to find the Pythagorean Theorem or look at the image above.

Hint 2:

The equation you set up to solve for the distance of the return trip should look like this:

4? + 5? = c?

Simplify by taking the squares of the constants.

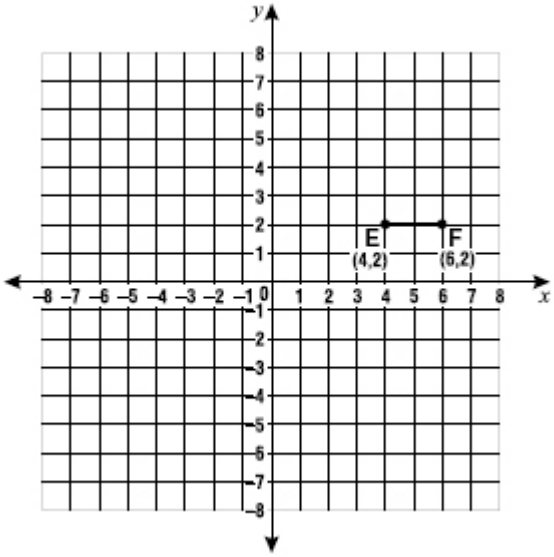
16 + 25 = c?

Hint 3:

c? = 41
c = √41
Now that you have each of the individual distances traveled by the boat, add them up to find the total distance traveled.
Hint 4:
total distance = 4 + 5 + √41
total distance = 9 + √41
Hint 5:
√41 is approximately 6.
total distance = 9 + 6 = 15
Choose answer choice C. 15 miles.

7.) "2003.33.10.h" (Problem ID: 15432) RADIO_BUTTON [MA - 2003 - Spring - 33]

No knowledge components have been assigned



The diagram above shows the location of EF on a coordinate plane.Suppose that EF is rotated 180 degrees clockwise about the origin. What are the coordinates of the image of point E?

Answers: (Interface Type: RADIO_BUTTON)

✗ (-2, -4)
✓ **(-4, -2)**
✗ (4, -2)
✗ (-4, 2)

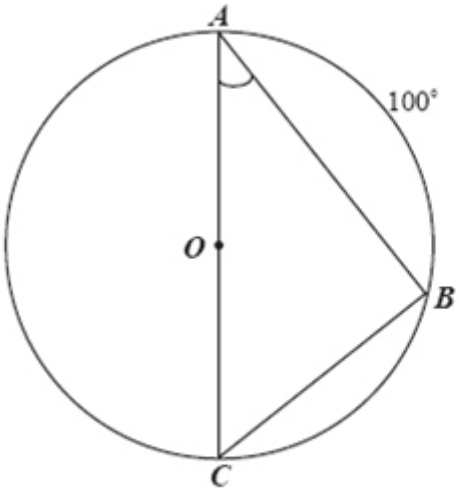
Hint 1:
A 180 degree rotation of an image around the origin can be found by doing a reflection across **both** the x-axis and the y-axis.
Hint 2:
In order to reflect a coordinate across the x-axis, multiply the y-coordinate by -1.
Hint 3:
In order to reflect a coordinate across the y-axis, multiply the x-coordinate by -1.
Hint 4:
To do a 180 degree rotation of an image around the origin, reflect the coordinate across the x-axis and the y-axis. To do this, you need to multiply both the x and y coordinates by -1.
Hint 5:
When you multiply both the x and y coordinates of the point E (4, 2) by -1, you get the point (-4, -

2).
Choose answer choice (-4, -2).

8.) "2002.19.10.h" (Problem ID: 15435) TEXT_FIELD [MA - 2002 - Spring - 19]

No knowledge components have been assigned

Use the figure below to answer question 19.



Triangle ABC is inscribed in a circle O. What is the measure of $\angle A$?

Answers: (Interface Type: TEXT_FIELD)

✔ **40**

Hint 1:
To find the measure of angle A, you need to find the arc length from B to C. Using the inscribed angle law, which states that the measure of an inscribed angle is half of its arc length, you can find the measure of angle A.
Hint 2:
The arc length of AC is half of the circle, meaning its arc length is half of 360, which is 180.

When you combine arc length AB and BC, you get arc length AC.
Hint 3:
The arc length of AC = AB + BC.
The arc length of AC is 180, and the arc length of BC is given in the problem to be 100.
Hint 4:
Ac = AB + BC
180 = 100 + BC
180 - 100 = 100 + BC - 100
180 - 100 = BC
BC = 80
Hint 5:
The measure of angle A, according to the Inscribed Angle Law, is half of the arc length of BC which is 80.
The measure of angle A = 80 / 2 = 40.
Type in 40.

End Random Order Section
End Linear Section

Module Name: 10thGradeRT-Hints

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Random Order Section

1.) "2003_5_10 HO" (Problem ID: 12508) RADIO_BUTTON [MA - 2002 - Spring - 1]

No knowledge components have been assigned

What is the simplified form of the expression √450

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 15√2**

✗ B. 45√2

✗ C. 75√2

✗ D. 225√2

(Problem ID: 12509) TEXT_FIELD [MA - 2002 - Spring - 1]

No knowledge components have been assigned

√450 is too large to easily do in our heads, so a good step would be to simplify the expression, √450. So if we break it up into two square roots with at least one we know the square root of it becomes more simple. What is the square root of a number we know goes into 450?

Answers: (Interface Type: TEXT_FIELD)

✓ **5**

Hint 1:
There are several simple perfect squares that can be used, choose one whose square root is less than 10

Hint 2:
The square root of 25 is 5 and 450 is divisible by 25. Divide 450 by 25 and then reduce the expression outside of the radical

Hint 3:
The correct answer is '5'. Please enter/select '5' (without quotes).

(Problem ID: 12510) TEXT_FIELD [MA - 2002 - Spring - 1]

No knowledge components have been assigned

Now, the √450 becomes 5√18 (the number of times 25 goes into 450. LetA?s repeat this same process for the A?18. What is a number that can be pulled out of 18 in the same manner as we did with the 5?

Answers: (Interface Type: TEXT_FIELD)

✓ **3**

Hint 1:
Figure out what factor of 18 we know the square root of then write that square root.

Hint 2:
9 goes into 18 and we know the square root of 9

Hint 3:

The correct answer is '3'. Please enter/select '3' (without quotes).

(Problem ID: 12511) TEXT_FIELD [MA - 2002 - Spring - 1]

No knowledge components have been assigned

Now the expression looks like this $5\sqrt{3}\sqrt{2}$. Simplify the expression

Answers: (Interface Type: TEXT_FIELD)

✔ **$15\sqrt{2}$**

Hint 1:

Multiply the 5 times the 3 then input the answer.

Hint 2:

The correct answer is '$15\sqrt{2}$'. Please enter/select '$15\sqrt{2}$' (without quotes).

2.) "2005_41a_10HO" (Problem ID: 15289) TEXT_FIELD

No knowledge components have been assigned

$\left(\frac{4}{3}\right)^4$ Egyptian approximation

$\frac{355}{113}$ Chinese approximation

$\frac{22}{7}$ Archimedes' approximation (Greek)

In a report on the history of irrational numbers, Celine compared three different values that have been used to approximate π. The values are listed above.

Celine compared $(4/3)^4$, the approximation used by the Eqyptians, to 22/7, a value that she often uses for π. She converted both $(4/3)^4$ and 22/7 to decimals rounded to four decimal places (nearest ten-thousandth). To the nearest ten-thousandth, what is the absolute value of the difference between $(4/3)^4$ and 22/7?

Answers: (Interface Type: TEXT_FIELD)

✔ **0.0176**

✔ **.0176**

3.) "2005_41a_10Ho" (Problem ID: 15294) TEXT_FIELD

No knowledge components have been assigned

$\left(\frac{4}{3}\right)^4$ Egyptian approximation

$\frac{355}{113}$ Chinese approximation

$\frac{22}{7}$ Archimedes' approximation (Greek)

In a report on the history of irrational numbers, Celine compared three different values that have been used to approximate π. The values are listed above.

Celine compared $(4/3)^4$, the approximation used by the Eqyptians, to 22/7, a value that she often uses for π. She converted both $(4/3)^4$ and 22/7 to decimals rounded to four decimal places (nearest ten-thousandth). To the nearest ten-thousandth, what is the absolute value of the difference between $(4/3)^4$ and 22/7?

Answers: (Interface Type: TEXT_FIELD)
✔ **0.0176**
✔ **.0176**

(Problem ID: 15295) ALGEBRA_FIELD
No knowledge components have been assigned

In a report on the history of irrational numbers, Celine compared three different values that have been used to approximate ?. The values are listed above.

Celine compared $(4/3)^4$, the approximation used by the Eqyptians, to 22/7, a value that she often uses for ?. She converted both $(4/3)^4$ and 22/7 to decimals rounded to four decimal places (nearest ten-thousandth). To the nearest ten-thousandth, what is the absolute value of the difference between $(4/3)^4$ and 22/7?

Answers: (Interface Type: ALGEBRA_FIELD)
✔ **0.0176**

Hint 1:
Remember, round up if the number in the 5th decimal position is 5 or higher, otherwise round down.
Hint 2:
$(4/3)^4$ comes out in your calculator looking like 3.160493827.... The 4 is in the ten-thousandth place, round it up, because of the 9 after it.
Hint 3:
$(4/3)^4$ rounds to 3.1605.
Hint 4:
Now find 22/7 in decimal form.
Hint 5:
22/7 comes out in your calculator looking like 3.142857143.... The 8 is in the ten-thousandth place, round it up, because of the 5 after it.
Hint 6:
22/7 rounds to 3.1429.
Hint 7:
Now subtract the two values, 3.1605 and 3.1429.
Hint 8:
3.1605-3.1429 is 0.0176. Enter 0.0176 as your final answer.

4.) "2005nov_7_10Ho" (Problem ID: 15297) RADIO_BUTTON [MA - 2001 - Spring - 32]

No knowledge components have been assigned

$\sqrt{65} - \sqrt[3]{65}$

Which of the following is closest to the value of the expression shown above?

Answers: (Interface Type: RADIO_BUTTON)

✗ 3
✗ 5
✗ 2
✓ **4**

(Problem ID: 15298) RADIO_BUTTON [MA - 2001 - Spring - 32]

No knowledge components have been assigned

$\sqrt{65} - \sqrt[3]{65}$

Which of the following is closest to the value of the expression shown above?

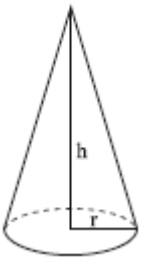
Answers: (Interface Type: RADIO_BUTTON)

✗ 2
✗ 3
✓ **4**
✗ 5

Hint 1:
Let's start here. What number near 65 would be an easy number to find the square root of?
Hint 2:
If you are having a problem with finding an easy perfect square, then try squaring some low numbers and see if any get close to 65, try 6^2, 7^2, 8^2, and 9^2
Hint 3:
6^2 is 36, 7^2 is 49, 8^2 is 64, and 9^2 is 81, which of these is close to 65?
Hint 4:
8^2 or 64 is very close to 65. So we can estimate 65 as 64.
Hint 5:
Now we should see if the same estimation works for the $\sqrt[3]{65}$. What number multiplied by itself 3 times equals 64?
Hint 6:
Since most of us don't memorize very many cubes, try cubing some very low numbers. Try 2,3,4, and 5
Hint 7:
2^3 is 8, 3^3 is 27, 4^3 is 64, and 5^3 is 125. So 4 cubed is very close to 64.
Hint 8:
Now, let's reduce what we have estimated, $\sqrt{(64)}-\sqrt[3]{(64)}$, what does this expression reduce to from the choices?
Hint 9:
We have already determined what the value for our roots our, subtract those two values.
Hint 10:
$\sqrt{(64)}-\sqrt[3]{(64)}$ is 8-4, which is equal to 4. Choose 4.

5.) "2000_13a_10Ho" (Problem ID: 15312) TEXT_FIELD

No knowledge components have been assigned



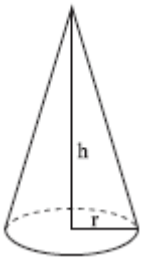
If the height of the cone, shown above, is doubled, the volume of the cone is how many times larger?

Answers: (Interface Type: TEXT_FIELD)

✔ **2**

(Problem ID: 15316) TEXT_FIELD

No knowledge components have been assigned



If the height of the cone, shown above, is doubled, the volume of the cone is how many times larger?

Answers: (Interface Type: TEXT_FIELD)

✔ **2**

Hint 1:
First, we need to know how to find the volume of a cone. What is the volume of a cone with r=2 and h=2?

Hint 2:
Check your reference sheet for the correct formula.

Hint 3:
The volume of a cone is $(\pi r^2 h)/3$. Substitute 2 in for r, and 2 in for h.

Hint 4:
If we substitute in 2 and 2 for r and h, we get $(\pi 2^2 2)/3$

Hint 5:
Simplifying we get this:

$(\pi 2^2 2)/3$

$(\pi 4*2)/3$

$(\pi 8)/3$

Or $8\pi/3$.

Hint 6:
Now, let's compare this volume of $8\pi/3$ to the volume of a cone with a radius still of 2, but

with a new height of 4 (double the height). What would the volume of this new cone be?
Hint 7:
Remember, substitute the new height of 4 and the radius of 2 into our equation, $(\pi r^2 h)/3$.
Hint 8:
After substituting in and simplifying we get this:

$(\pi 2^2 4)/3$

$(\pi 4*4)/3$

$(\pi 16)/3$

Or $16\pi/3$.

Hint 9:
Now, let's compare our two cones. The cone with height 2 has a volume of $8\pi/3$ and the cone with height 4 has a volume of $16\pi/3$. How many times bigger is the cone with twice the height?
Hint 10:
How many times does $8\pi/3$ go into $16\pi/3$?
Hint 11:
Since both $8\pi/3$ and $16\pi/3$ have $\pi/3$ as a factor we can just divide 16/8 to find the answer.
Hint 12:
16/8= 2. Type 2.

6.) "2003_5_10HO" (Problem ID: 20840) RADIO_BUTTON [MA - 2003 - SPRING - 5]

No knowledge components have been assigned

What is the simplified form of the expression √(450)

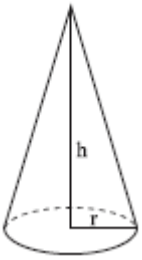
Answers: (Interface Type: RADIO_BUTTON)

✔ **A. $15\sqrt{2}$**
✘ B. $45\sqrt{2}$
✘ C. $75\sqrt{2}$
✘ D. $225\sqrt{2}$

Hint 1:
In order to simplify a square root expression you have to separate the number inside (450) into perfect squares. Try find the biggest perfect square that is a factor of 450. Start with an easy number like 10^2 (100). Then try powers of 5 after that.
Hint 2:
10^2 is a factor of 450, but try 15^2.
Hint 3:
15^2 or 225 is also a factor of 450. Now we can separate 450 into √225 and √2 The two factors of √450.
Hint 4:
Finally, let's simplify the expression √225√2 and choose it from the choices above. (Remember √225 is equal to 15)

7.) "2000_13a_10Hint(2006/11/20 18:01:24)" (Problem ID: 21625) TEXT_FIELD [MA - 2000 - SPRING - 13a]

No knowledge components have been assigned



If the height of the cone, shown above, is doubled, the volume of the cone is how many times larger?

Answers: (Interface Type: TEXT_FIELD)

✔ **2**

Hint 1:
First, use your reference sheet to find the volume of a cone.
Hint 2:
Try using arbitrary values of h and r (such as 2) and find the Volume.
Hint 3:
Now, once you find the volume of the cone for h=2 and r=2, double the height, as told to do, and compare the new volume to the original volume.
Hint 4:
With h=2 and r=2 the volume is $8\pi/3$, when the height is doubled (h=4, r=2) the volume is $16\pi/3$
Hint 5:
If you divide the new volume ($16\pi/3$) by the original volume ($8\pi/3$) the amount which the volume changes can be found.
Hint 6:
$(6\pi/3)/(8\pi/3)=2$, so the volume doubles if the height is doubled. Enter 2.

End Random Order Section
End Linear Section

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Module Worksheet

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[FAQ]

Christopher Freeman

You are currently at: **Curriculum Pretty-Print**

Module Name: QuizzesCPF-ALL

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

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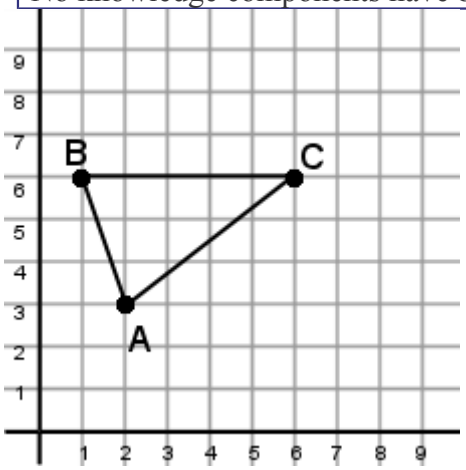
1.) "Stretch_and_Shrink_Inv_2_1" (Problem ID: 14134) TEXT_FIELD

No knowledge components have been assigned

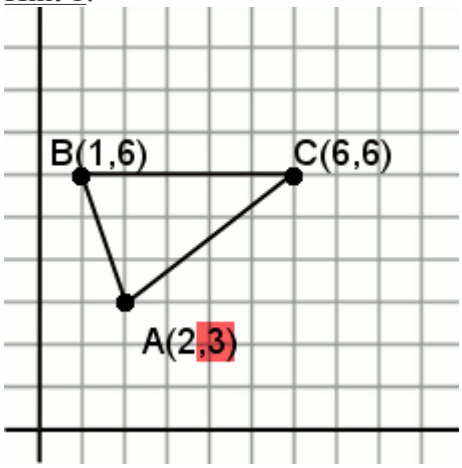


The rule (2x, 2y) was applied to the figure above. What is the value of the y coordinate for the image A' of A?

Answers: (Interface Type: TEXT_FIELD)

✓ **6**

Hint 1:



The y-coordinate of A is highlighted in red above in the picture. What happens to this value when the rule (2x, 2y) is applied?

Hint 2:

For the rule (2x, 2y), in place of the y-coordinate is the expression 2y. This means that our original y-coordinate will be doubled.

Hint 3:

2*3 = 6

Type in 6

2.) "Stretch_and_Shrink_Inv_2_2" (Problem ID: 14135) RADIO_BUTTON

No knowledge components have been assigned

A. $\left(\frac{1}{3}x, y\right)$ C. $\left(\frac{1}{2}x, 3y\right)$

B. $\left(3x, \frac{1}{2}y\right)$ D. $(3x, 2y)$

An image has width x and length y. Which of the given rules will give an image that is taller than the original image, but also thinner?

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

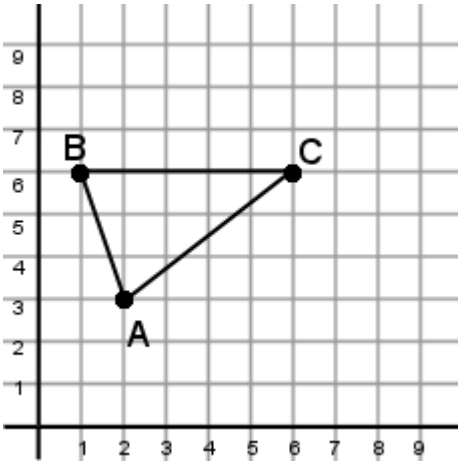
Hint 1:
To make the image taller, we want to stretch out the y-coordinates. To make the image thinner, we will want to make the x-coordinates shrink.

Hint 2:
For our rule, we will want to multiply our y-coordinates by a large number to stretch them. We will also want to multiply our x-coordinates by a fraction to shrink them. Which rule does this?

Hint 3:
The correct answer is C. Please select C

3.) "Stretch_and_Shrink_Inv_2_3" (Problem ID: 14136) TEXT_FIELD

No knowledge components have been assigned



If the rule (2x, 2y) is applied to the triangle ABC in the figure, how many times larger is the area of the image than the area of the original triangle?

Answers: (Interface Type: TEXT_FIELD)

✔ **4**

Hint 1:

$$A = \frac{1}{2}bh$$

Consider the formula for the area of a triangle (shown above)

The base of a triangle, b, and the height of a triangle, h, are both line segments.

Hint 2:

The rule (2x,2y) stretches the base and the height, doubling them.

(2x, 2y) also means that the scale factor is 2. If the scale factor is 2 then the area will increase by 2*2 or 4 times.

Hint 3:

$$A = \frac{1}{2}(2b)(2h)$$

$$A = 4\left(\frac{1}{2}bh\right)$$

Original Height

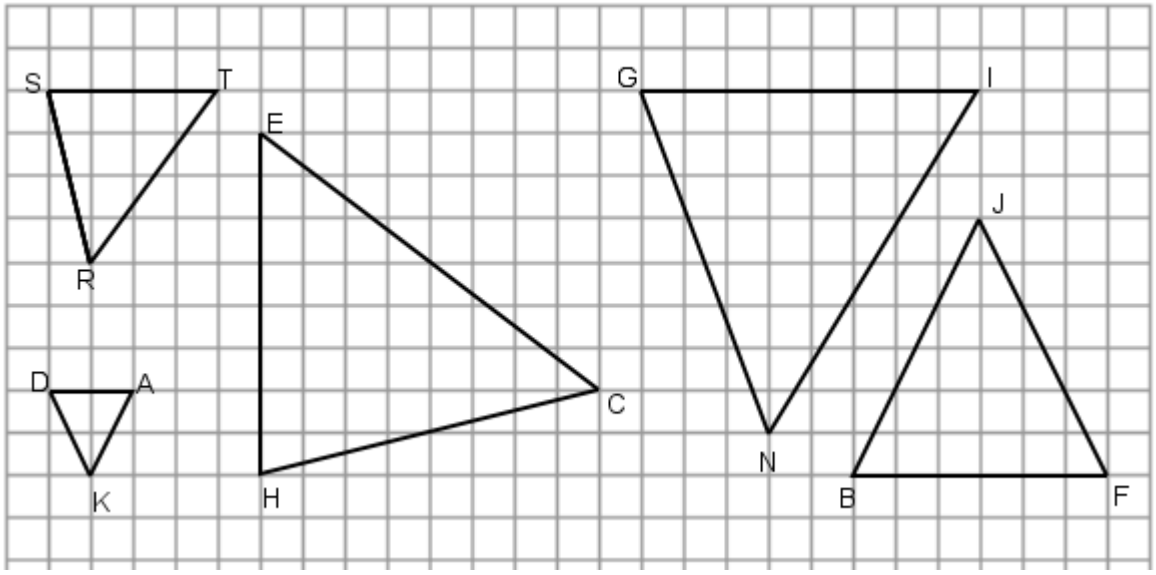
Above the work shows the height of the stretched figure. It is four times the area of the original triangle.

Hint 4:

The correct answer is 4. Please enter 4

4.) "Stretch_and_Shrink_Inv_2_5" (Problem ID: 14137) RADIO_BUTTON

No knowledge components have been assigned



Which triangle above is similar to STR?

Answers: (Interface Type: RADIO_BUTTON)

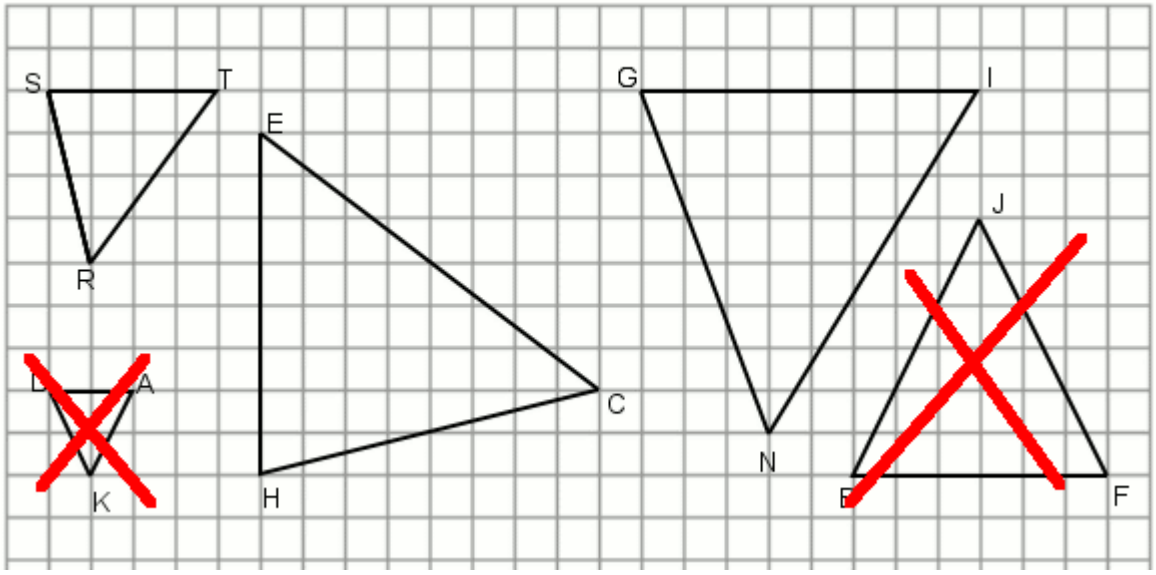
✗ A. DAK

✓ **B. HEC**

✗ C. GIN

✗ D. BFJ

Hint 1:



Note DAK and JBF are both isoceles, but STR is not. So they cannot be similar.

Hint 2:

This leaves HEC and GIN. Use the grid to compare STR to both HEC and GIN.

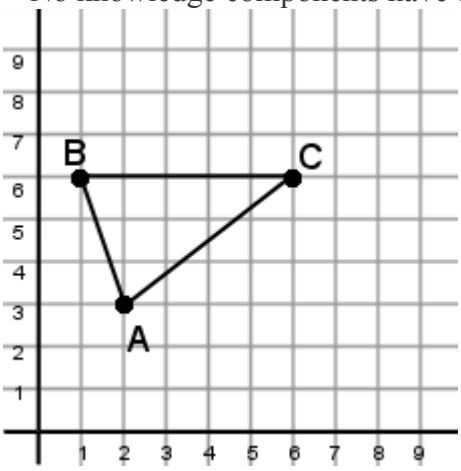
Similar triangles should have the same angles. The triangles should look the same, except that one may be bigger than the other. In other words, one may look like the other, except put under a magnifying glass.

Hint 3:

The correct answer is 'B. HEC'. Please select 'B. HEC'.

5.) "Stretch_and_Shrink_Inv_2_4" (Problem ID: 14138) TEXT_FIELD

No knowledge components have been assigned



If the rule (2x, 2y) is applied to the triangle ABC in the figure, how many times larger is the perimeter of the image than the perimeter of the original?

Answers: (Interface Type: TEXT_FIELD)

✔ **2**

Hint 1:
The rule (2x,2y) makes the line segments of triangle ABC two times as long.

The rule (2x, 2y) also means that the scale factor is 2.

Hint 2:
The perimeter of a triangle is the sum of the lengths of its line segments. Consider the following:

Pretend the line segment lengths are each X,Y, and Z. So the original perimeter is:
P = X + Y + Z

The perimeter when the line segments are doubled is:
P = 2X + 2Y + 2Z

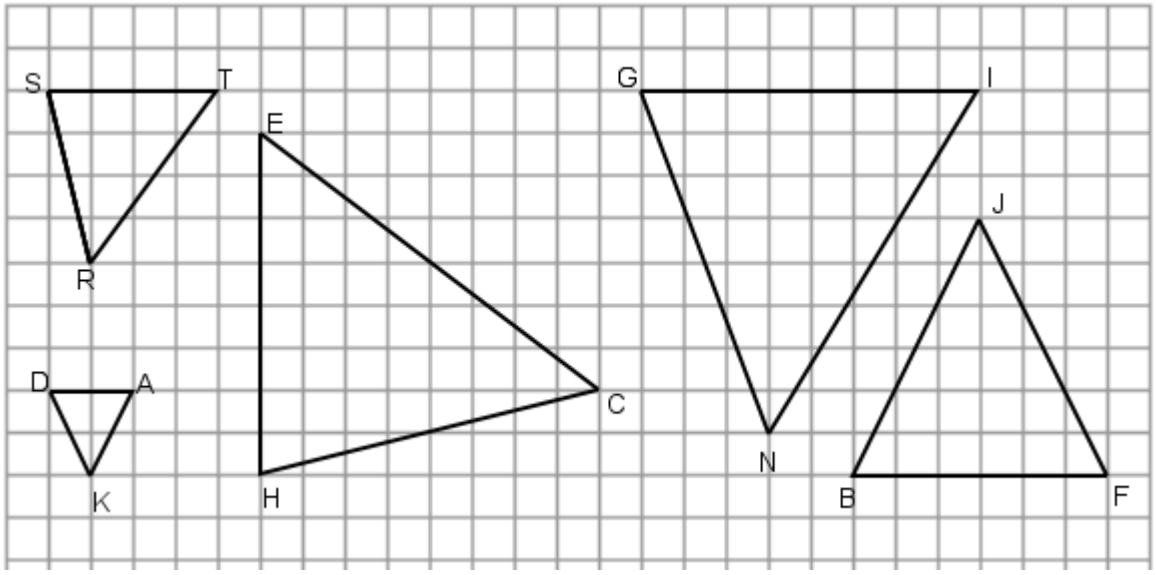
Hint 3:
So another way to say this is:
P = 2*(X + Y + Z)

You can see that the length of the perimeter is two times as long as the original.

Hint 4:
The correct answer is 2. Please enter '2'

6.) "Stretch_and_Shrink_Inv_2_6" (Problem ID: 14139) RADIO_BUTTON

No knowledge components have been assigned



Now that we know STR and HEC are similar. What side corresponds to SR in triangle ECH?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. EH

✗ B. CE

✓ **C. HC**

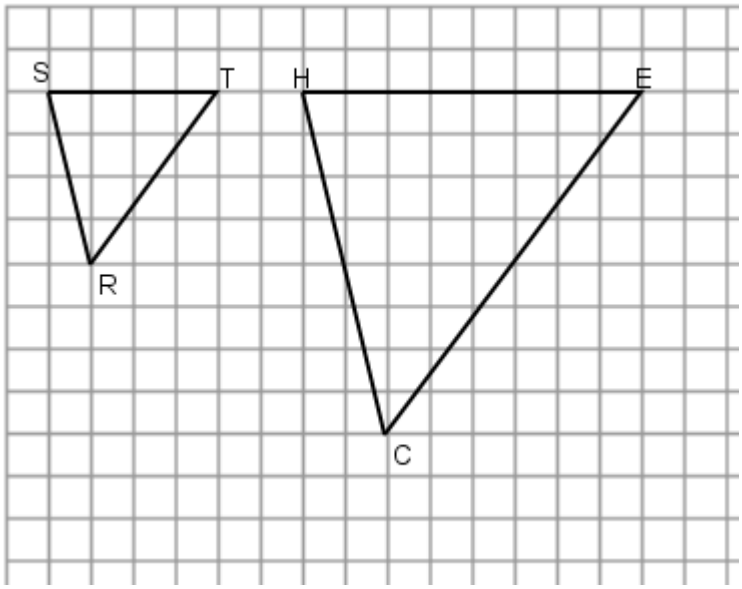
✗ D. Cannot be determined

Hint 1:

In may help to draw ECH reoriented to match STR on a piece of paper. Rotate ECH so it is lined up on the grid so that it is just like the triangle STR, but stretched.

Be careful not to mix up the letters!

Hint 2:



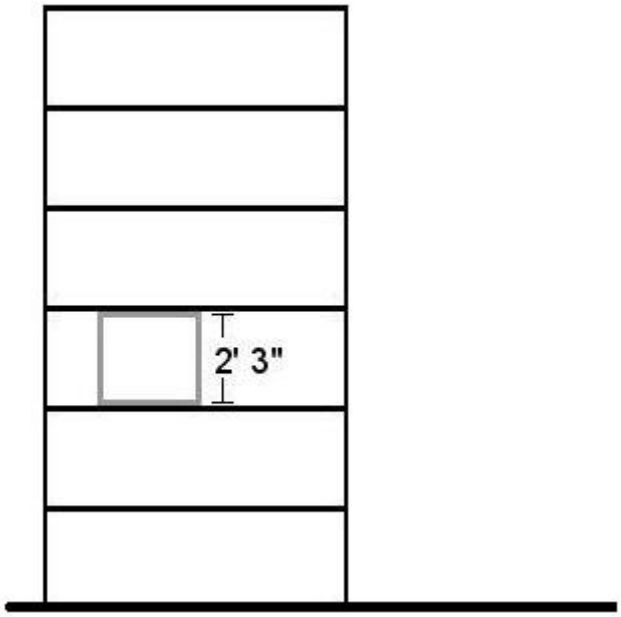
Above is a drawing with ECH rotated. Can you see which sides are corresponding now?

Hint 3:

Since the shortest side SR matches with the shortest side HC, they are corresponding. Select 'C. HC'

7.) "Stretching_and_Shrinking_Inv_1_1" (Problem ID: 14140) RADIO_BUTTON

No knowledge components have been assigned



A box was on a shelf in a big warehouse as shown above. The box was 2 feet 3 inches tall. The box fits perfectly height-wise in one of the alcoves and each alcove has the same width and height. About how many feet tall is the warehouse shelf?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 13' 6"**

✗ B. 12' 5"

✗ C. 13' 8"

✗ D. 15'

Hint 1:

Because the box sits perfectly height-wise on the shelf, we can assume that to be the height of the alcove. There are 6 alcoves, so multiply the height of box by 6. Be mindful of conversion from inches to feet and feet back to inches.

Hint 2:

$$Feet: 2*6=12\,\text{feet}$$

$$Inches: 3*6=18\,\text{inches}=12\,\text{inches}+6\,\text{inches}$$

$$=1\,\text{foot and }6\,\text{inches}$$

And so,

$$12+1\,\text{feet and }6\,\text{inches}=13\,\text{feet }6\,\text{inches}$$

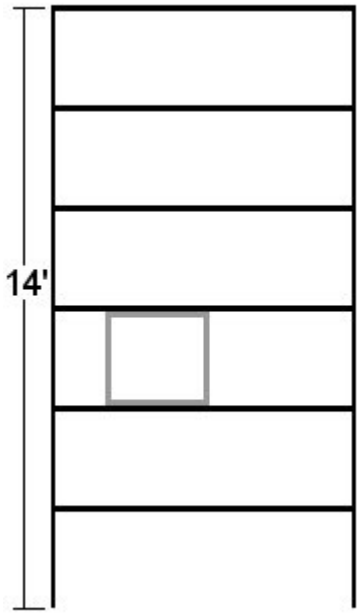
false

Hint 3:

13 feet 6 inches is 13' 6" so select A. 13' 6"

8.) "Stretching_and_Shrinking_Inv_1_2" (Problem ID: 14141) RADIO_BUTTON

No knowledge components have been assigned



A warehouse shelf is 14 feet tall and is divided into 6 equally sized alcoves. A box sits perfectly height-wise in one of the alcoves. How tall is the box sitting on the shelf in feet and inches?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 3 ft. 5 in.
✗ B. 2 ft. 2 in.
✓ **C. 2 ft. 4 in.**
✗ D. 3 ft. 4 in.

Hint 1:
The box fits perfectly in the alcove height-wise, so the height of the alcove is the same as the height of the box. Divide the height of the whole shelf by 6, because there are 6 alcoves. This will be the height of the box.

Hint 2:

$$\frac{14}{6} = 2\frac{1}{3}$$

So that's 2 feet plus another $\frac{1}{3}$ of a foot.

What is $\frac{1}{3}$ of a foot in inches?

false

Hint 3:

To find $\frac{1}{3}$ of a foot in inches :

$12 * \frac{1}{3} = 4$ inches

false
Hint 4:
Together we have 2 feet and 4 inches, so select C. 2 ft. 4 in.

9.) "Stretching_and_Shrinking_Inv_1_3" (Problem ID: 14142) TEXT_FIELD

No knowledge components have been assigned
What is 120% of 40?
Answers: (Interface Type: TEXT_FIELD)
✓ **48**
Hint 1:
To find 120% of 40, find 1.2 * 40
Hint 2:
1.2 * 40 = 48
Hint 3:
The correct answer is 48. Please enter 48

10.) "Stretch_and_Shrink_Inv_1_4" (Problem ID: 14143) RADIO_BUTTON

No knowledge components have been assigned
Jeff is going to make an image of a trapezoid on a copy machine. He selects the scale factor 25%. What will happen to the **measure of the angles** of the trapezoid?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. They will become 1/4 the size
✓ **B. They will stay the same**
✗ C. They will become 4 times the size.
✗ D. It cannot be determined.,
Hint 1:

Shown above are a trapezoid and the same trapezoid scaled down. What happens to the angles?
Hint 2:
They stay the same. Select B

11.) "Stretch_and_Shrink_Inv_1_5" (Problem ID: 14144) RADIO_BUTTON

No knowledge components have been assigned

Jeff is going to make an image of a trapezoid on a copy machine. He selects the scale factor 25%. What will happen to the **side lengths** of the trapezoid?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. They will become 1/4 the size**

✗ B. They will stay the same

✗ C. They will become 4 times the size.

✗ D. It cannot be determined.,

Hint 1:

Each of the side lengths will be scaled down to 25% of their size. This is the same as making them 25/100 as big, or 1/4.

Hint 2:

The correct answer is A. They will be 1/4 the size. Select A.

12.) "Stretch_and_Shrink_Inv_1_6" (Problem ID: 14145) RADIO_BUTTON

No knowledge components have been assigned

Jeff is going to make an image of a trapezoid on a copy machine. He selects the scale factor **400%.** What will happen to the **side lengths** of the trapezoid?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. They will become 1/4 the size

✗ B. They will stay the same

✓ **C. They will become 4 times the size.**

✗ D. It cannot be determined.,

Hint 1:

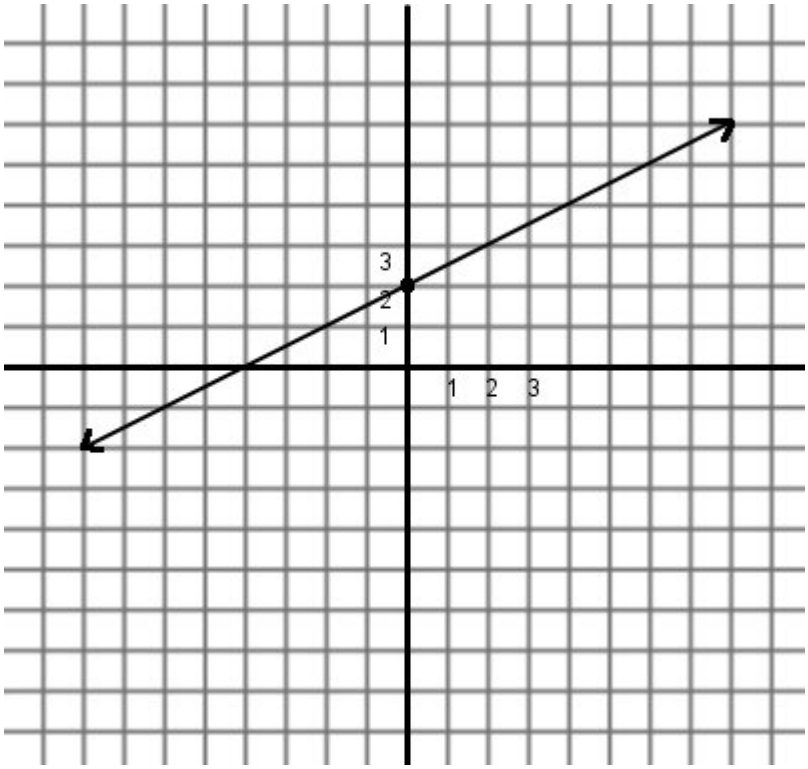
Each of the side lengths will be blown up to 400% of their size. This is the same as making them 400/100 times as big, or 4.

Hint 2:

The answer is C. They will be 4 times the size. Select C

13.) "Moving_Straight_Ahead_Inv_4_1" (Problem ID: 14146) ALGEBRA_FIELD

No knowledge components have been assigned

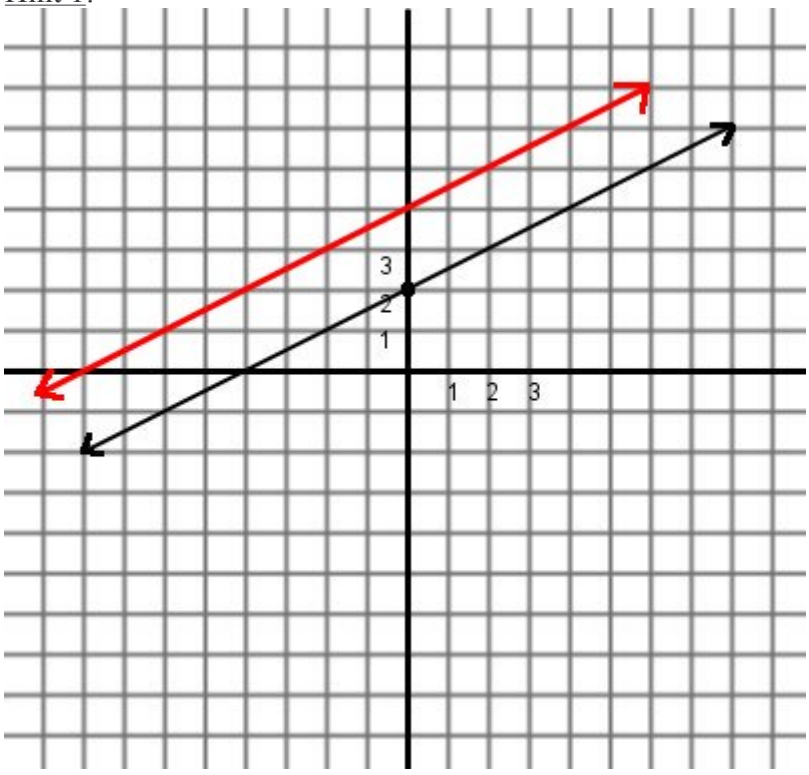


What is the slope for a line that is parallel to the line above?

Answers: (Interface Type: ALGEBRA_FIELD)

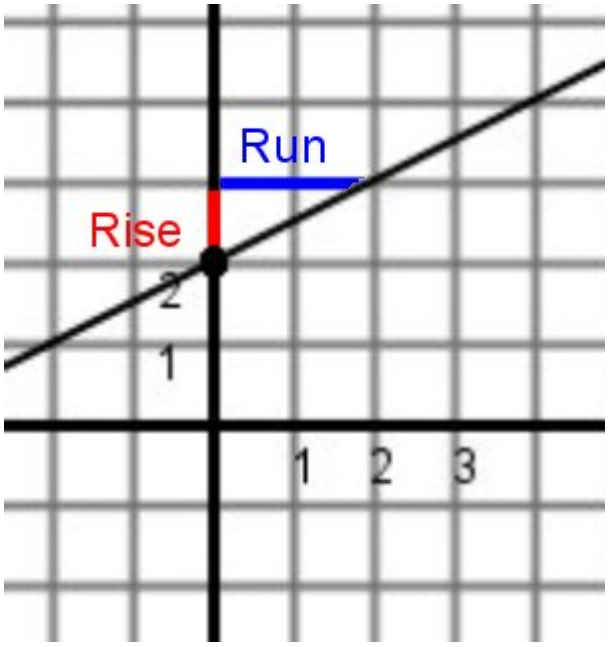
✔ **1/2**

Hint 1:



Lines that are parallel have the same slope. Find the slope of the original line. The graph above shows a line in red that is parallel to the original line. They have the same slope.

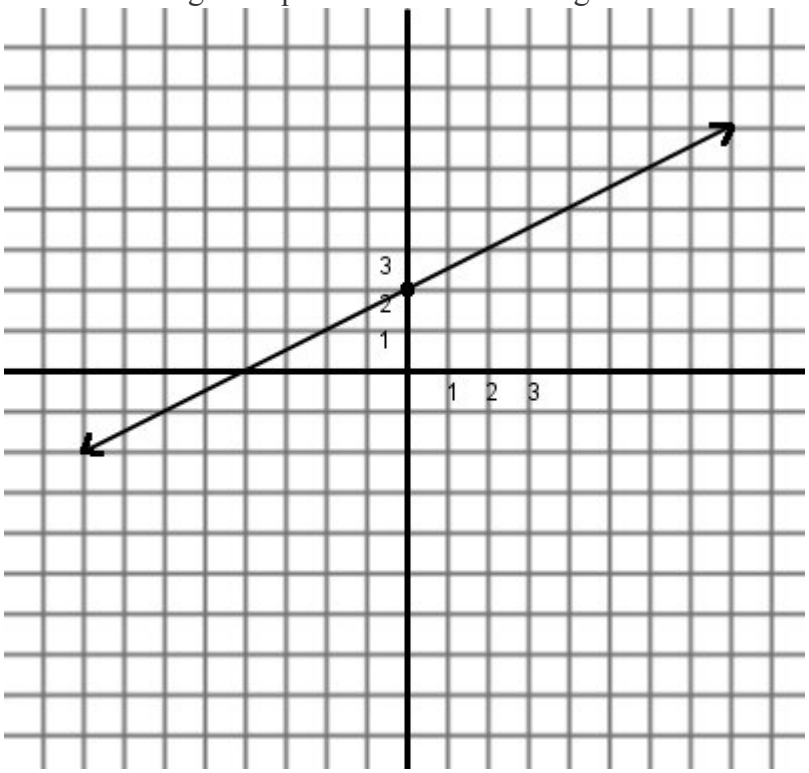
Hint 2:



Remember, the slope can be calculated as the rise over the run.
Hint 3:
The rise in red is 1 and the run in blue is 2, so the slope of the line is 1/2
Hint 4:
Since the slope of our line is 1/2, the slope of any line parallel to it would be the same. Enter 1/2

14.) "Moving_Straight_Ahead_Inv_4_2" (Problem ID: 14147) ALGEBRA_FIELD

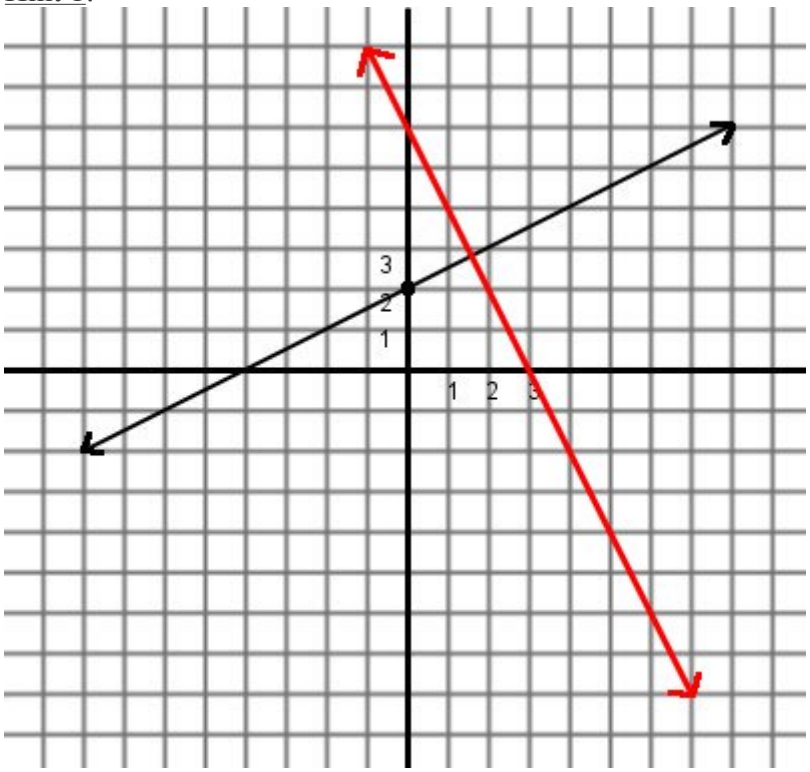
No knowledge components have been assigned



What is the slope for a line that is perpendicular to the line above?
Answers: (Interface Type: ALGEBRA_FIELD)

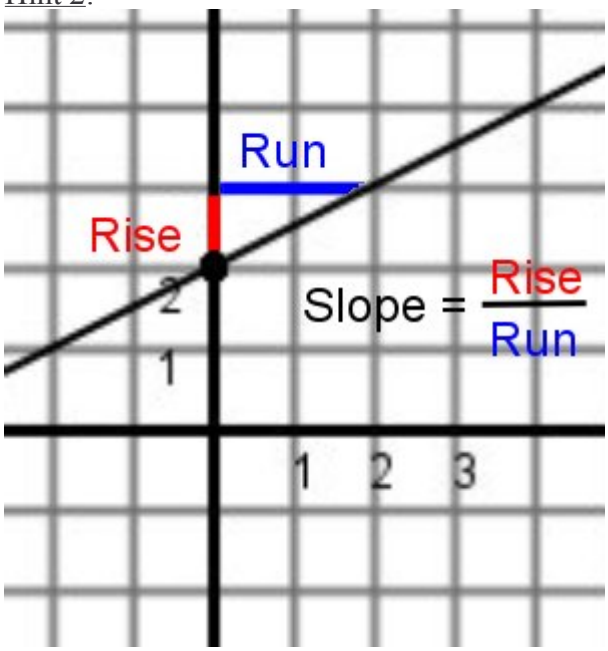
✔ **-2**

Hint 1:



The slope of a a perpendicular line will be the *negative reciprocal* of the slope of the original line. A perpendicular line is shown above. First find the original slope in fractional form, then swap the numerator and the denominator. After that, switch the sign. If it is negative, make it positive. If it is positive, make it negative.

Hint 2:



First find the slope of the original line. Remember the slope is the rise over the run. Here, the rise is 1 and the run is 2.

Hint 3:

So the slope is 1/2. This is the slope of the original line, now find the slope of a perpendicular

line.
Hint 4:
The reciprocal of 1/2 is 2/1 = 2. Now make it opposite by switching the sign. So the slope of the perpendicular line is -2. Enter -2.
Hint 5:
The correct answer is -2. Please enter -2

15.) "Moving_Straight_Ahead_Inv_4_3" (Problem ID: 14148) TEXT_FIELD

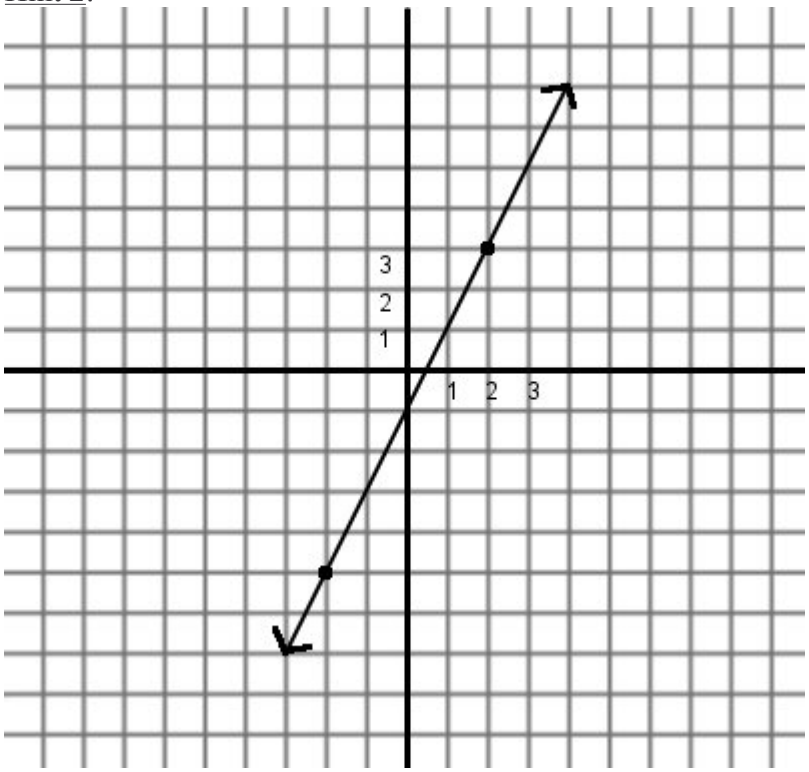
No knowledge components have been assigned

What is the slope of the line that goes through the points (2,3) and (-2, -5)?

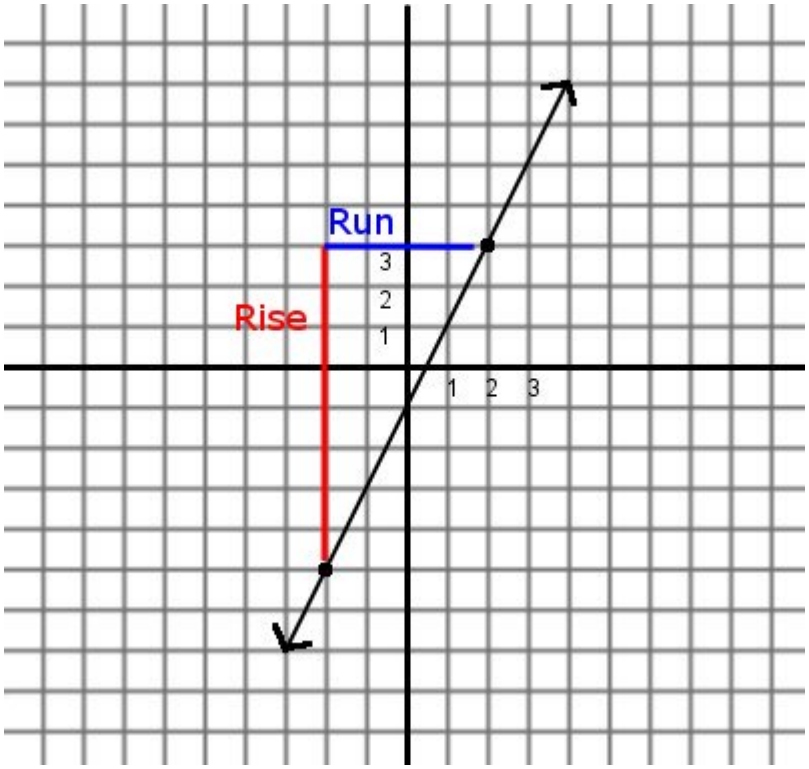
Answers: (Interface Type: TEXT_FIELD)

✔ **2**

Hint 1:
You may want to plot the points on graph paper first.
Hint 2:



The graph is plotted in the image above. Use the definition of the slope.
Hint 3:



We can calculate the slope from any two points using the rise over the run. Let's use the initial points.

Hint 4:

The rise is 8 and the run is 4. So the slope is 8/4. Let's reduce this fraction.

Hint 5:

8/4 is 2. So the correct answer is 2.

16.) "Moving_Straight_Ahead_Inv_4_4" (Problem ID: 14149) TEXT_FIELD

No knowledge components have been assigned

What is the y-intercept of the line that goes through the points (2, 3) and (-2, -5)?

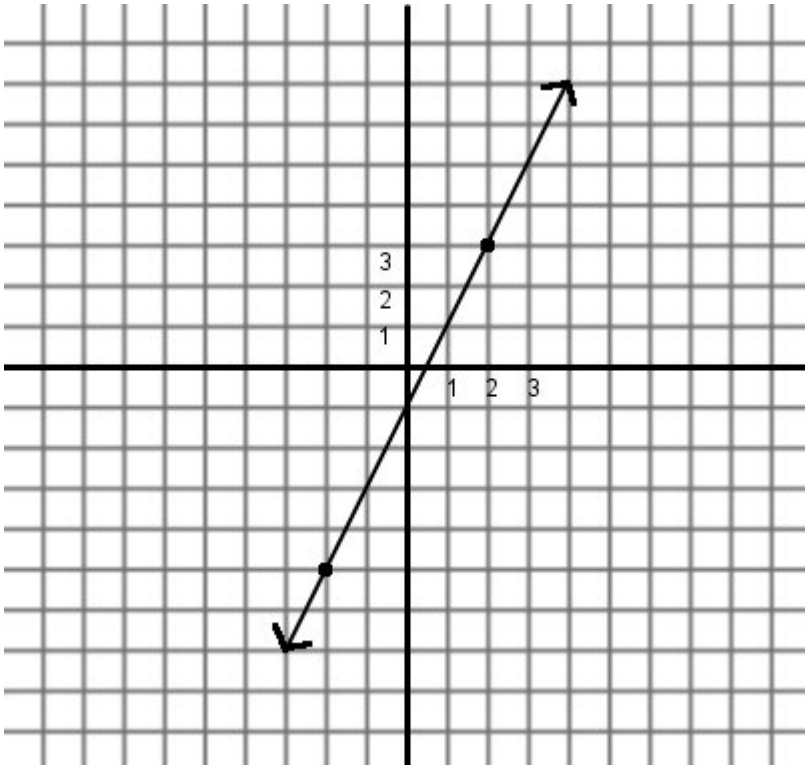
Answers: (Interface Type: TEXT_FIELD)

✓ **-1**

Hint 1:

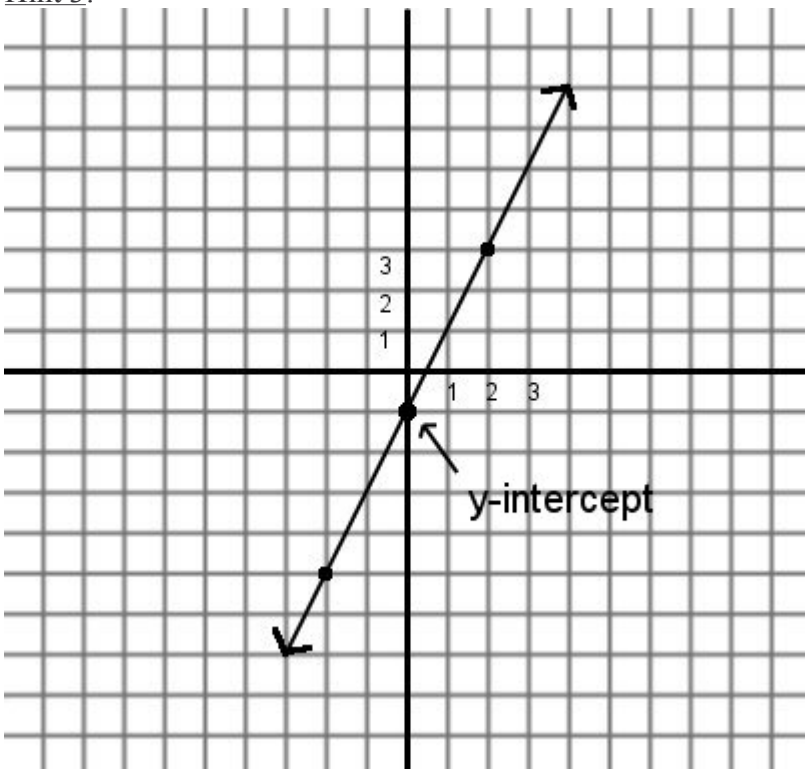
You may want to plot the points on graph paper first.

Hint 2:



Shown above are the plotted points with a line running through them. Where is the y-intercept?
The y-intercept is the intersection of y-axis and the line

Hint 3:



The y-intercept is pointed out in the picture above.

Hint 4:

The y-intercept is the value of y when x is 0. Here, it is -1. So enter -1

17.) "Moving_Straight_Ahead_Inv_4_5" (Problem ID: 14150) TEXT_FIELD

No knowledge components have been assigned

The equation y = b + 1.5x passes through the point (4,7) what is the value of b?

Answers: (Interface Type: TEXT_FIELD)

✔ **1**

Hint 1:

Since (4,7) is on the line, substitute in 4 for the value of x and 7 for the value of y. Now solve for b.

Hint 2:

$$y = b + 1.5x$$

$$7 = b + 1.5(4)$$

Substitute in as shown.

Hint 3:

$$y = b + 1.5x$$

$$7 = b + 1.5(4)$$

$$7 = b + 6$$

$$7 - 6 = b$$

Check your work against the work above. What is b?

Hint 4:

The correct answer is 1. Please enter 1

18.) "Moving_Straight_Ahead_Inv_4_6" (Problem ID: 14151) RADIO_BUTTON

No knowledge components have been assigned

Which one of these statements is not true for the equation y = -4x + 3?

Answers: (Interface Type: RADIO_BUTTON)

✘ A. Slope is negative *The slope is the coefficient of x. This is a negative number. So it is a true statement.*

✘ B. y-intercept is positive *The y-intercept is the constant number, in this case 3, which is postiive. So it is true statement.*

✔ **C. passes through (4, 19)**

✘ D. passes through (3, -9) *Substitute in for x and y with 3 and -9. The equation holds true. So this is a true statement.*

Hint 1:

Write A, B, C, and D on your paper then read them and write next to them whether they are true or false. The one that is not true is the answer.

Hint 2:

We can see that the line does not pass through (4, 19) when we substitute that point into the equation. So select C, it is false.

19.) "Stretching_and_Shrinking_Inv_3_1" (Problem ID: 14152) TEXT_FIELD

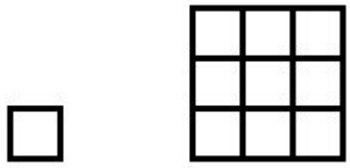
No knowledge components have been assigned

Draw a sketch of 9 squares put together to make a larger square. What is the scale factor from one square to the new square made from 9 squares?

Answers: (Interface Type: TEXT_FIELD)

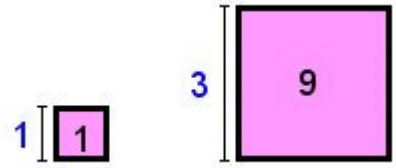
✔ **3**

Hint 1:



false

Hint 2:



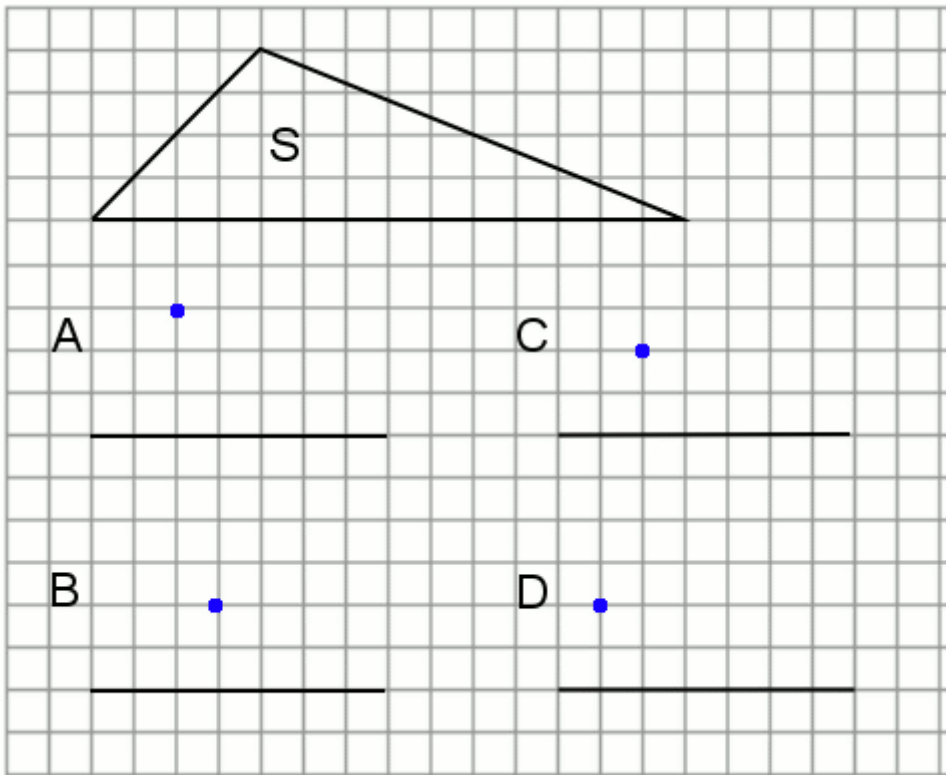
The area (in pink) of the big square is 9 times larger than the small square. The side (in blue) of the big square is 3 times larger than the small square.

Hint 3:

3 is 3 (blue) times as large as 1 so the scale factor is 3. Type in 3.

20.) "Stretch_and_Shrinking_Inv_3_2" (Problem ID: 14153) RADIO_BUTTON

No knowledge components have been assigned



Jill is making a triangle that is similar to triangle S. She is using the scale factor 1/2 so she knows the base should be 7 units long. Since the base of S is 14 units long. In which picture has she placed the 3rd vertex in the correct position?

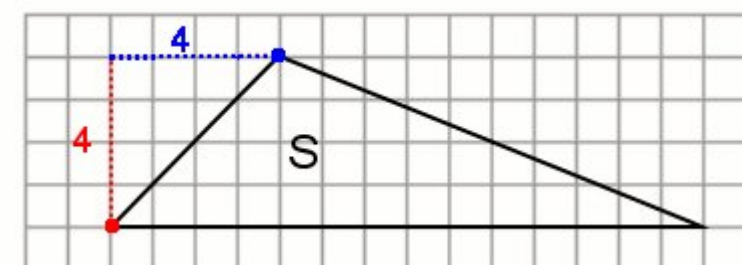
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:

The correct placement of the blue dot will result in a triangle (by connecting the blue dot to each end of the base) that is similar to triangle S and is a scale factor of 1/2 of triangle S.

Hint 2:

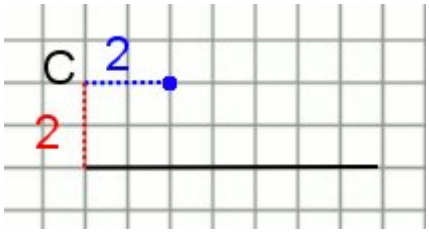


Notice in the picture that the height between the bottom left point and the top point is 4. So the new height must be 2.

Hint 3:

The distance (the distance in the left-right direction only) between those same two points is 4. So the new width should be 2.

Hint 4:



C is the only one that fits both of these requirements. Select C

21.) "Moving_Straight_Ahead_Inv_4_7" (Problem ID: 14154) TEXT_FIELD

No knowledge components have been assigned

x	2	3	4	5	6	
y	-4	-5.5	-7	-8.5	-10	

What is the slope of the line that fits the data given?

Answers: (Interface Type: TEXT_FIELD)

✔ **-1.5**

✔ **-3/2**

Hint 1:

The slope can be measured by finding out how much y changes for every change of x by 1. The table shows values of x changing by 1 and the corresponding y values. How much does y change by each time? This will be the slope.

Hint 2:

x	2	3	4	5	6	
y	-4	-5.5	-7	-8.5	-10	

-1.5 -1.5 -1.5 -1.5

As x increases by 1, y is decreasing by -1.5. So the slope will be -1.5

22.) "Moving_Straight_Ahead_Inv_4_8" (Problem ID: 14155) TEXT_FIELD

No knowledge components have been assigned

x	2	3	4	5	6	
y	-4	-5.5	-7	-8.5	-10	

What is the y-intercept of the line that fits the data given?

Earlier, you found that the slope was -1.5.

Answers: (Interface Type: TEXT_FIELD)

✔ **-1**

Hint 1:

The y-intercept is where the x value is 0.

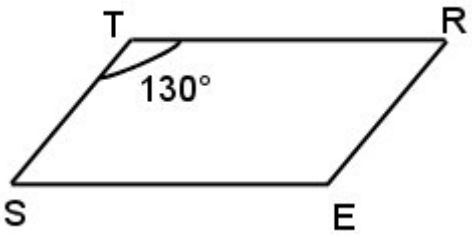
Draw the table on paper and add room for the values of x go back to zero. Fill in the values of x and the corresponding values of y. What is y equal to when x is 0?
Hint 2:

x	0	1	2	3	4	5	6	
y	-1	-2.5	-4	-5.5	-7	-8.5	-10	

The filled-in table is shown above. What is the y-intercept?
Hint 3:
Since y = 1 when x = 0, the y-intercept is 1. Enter 1.

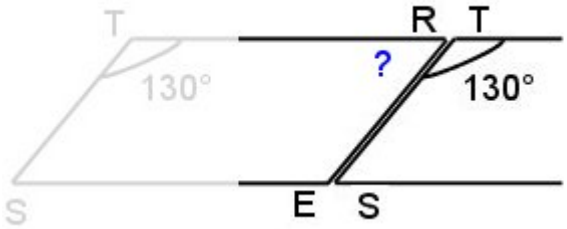
23.) "Stretching_and_Shrinking_Inv_3_3" (Problem ID: 14156) TEXT_FIELD

No knowledge components have been assigned



What is the measure of angle R?
Answers: (Interface Type: TEXT_FIELD)
✔ **50**

Hint 1:
The sum of the interior angles of a parallelogram is 360?
Hint 2:

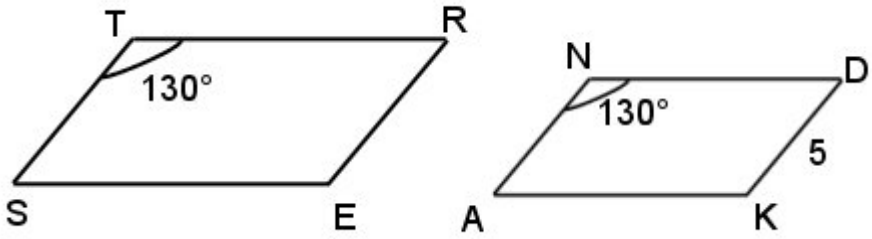


By cutting the parallelogram in half and rearranging it, we see that the angle R and the angle we know, 130?, make an angle of 180?.
Hint 3:
So, 130 + x = 180

What should x be?
Hint 4:
x = 50, so type in 50

24.) "Stretching_And_Shrinking_Inv_3_4" (Problem ID: 14157) TEXT_FIELD

No knowledge components have been assigned



If we know the area of STRE is 9 times that of ANDK, what is the measure of ER? (Picture is not drawn to scale)

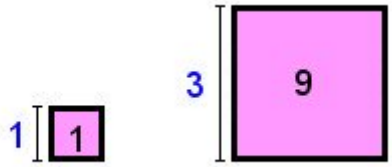
Answers: (Interface Type: TEXT_FIELD)

✔ **15**

Hint 1:

The two parallelograms are similar since they are both parallelograms and have a common angle of 130 degrees.

Hint 2:



When the area of a figure is 9 times as large the scale factor is 3. Refer to the picture above involving squares.

Hint 3:

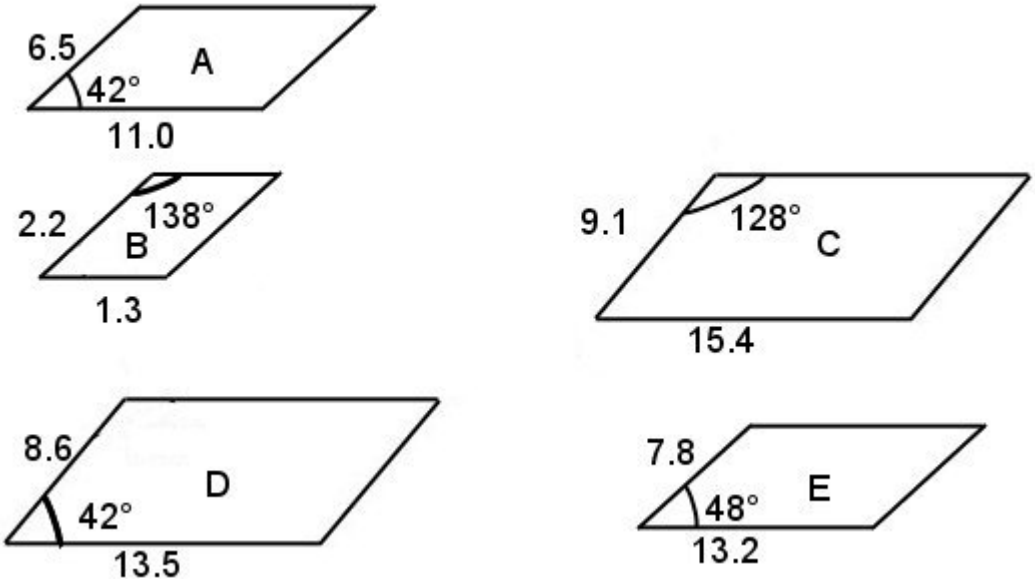
If the scale factor from the smaller parallelogram to the larger is 3, what is the measure of ER?

Hint 4:

3 * 5 = 15. Type in 15.

25.) "Stretching_and_Shrinking_Inv_4_1" (Problem ID: 14158) RADIO_BUTTON

No knowledge components have been assigned



Which parallelogram is similar to A?
Answers: (Interface Type: RADIO_BUTTON)
✓ **B**
✗ C
✗ D
✗ E

Hint 1:
If one angle of A is 42 then the other angle is 180-42 or 138. Therefore we can eliminate some parallelograms and choose from the ones with the same angles as A.
Hint 2:
Since C and E don't have the same angle measures as A they must be eliminated. Now look at the other parallelograms B and D.
Hint 3:
Use your calculator to see if the ratio of the long side to the short side in B and D match the ratio of the long side to the short side of A.
Hint 4:

$$A: \frac{11.0}{6.5} \approx 1.6923$$

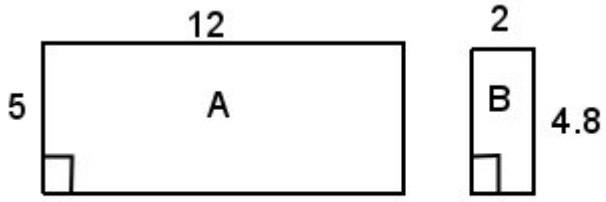
$$B: \frac{2.2}{1.3} \approx 1.6923$$

$$D: \frac{13.5}{8.6} \approx 1.5698$$

Here are the ratios and their decimal equivalents, which parallelogram is similar to A?
Hint 5:
Since the ratio of the long side to the short side of the parallelogram A and B are 1.6923 and they have equivalent angles, they are similar. Select B.

26.) "Stretching_and_Shrinking_Inv_4_2" (Problem ID: 14159) ALGEBRA_FIELD

No knowledge components have been assigned



Parallelogram A and B are similar. What is the scale factor from rectangle A to B?
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **.4**

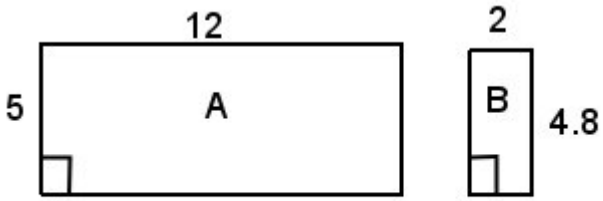
Hint 1:
Notice that the side of value 2 corresponds to the side of value 5. Also, the side of value 12

corresponds to the side of value 4.8.
Hint 2:
Another way to see scale factor here is asking how much would you multiply a side of A by to get the corresponding side of B?
Hint 3:
The side of length 2 of B corresponds to the side of length 5 of A. What do we multiply 5 by to get 2? Since 2 is less than 5, this number should be less than 1.
Hint 4:
5*.4 = 2 So the answer is .4

Please enter .4

27.) "Stretching_and_Shrinking_Inv_4_3" (Problem ID: 14160) ALGEBRA_FIELD

No knowledge components have been assigned



Parallelogram A and B are similar. What is the scale factor from rectangle **B to A**?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **2.5**

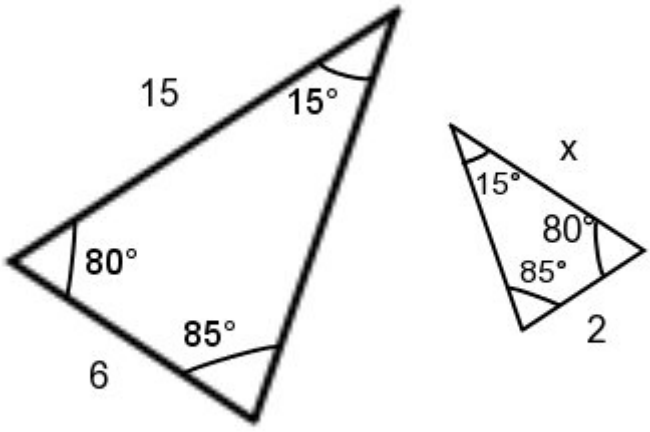
Hint 1:
Notice that the side of value 2 corresponds to the side of value 5. Also, the side of value 4.8 corresponds to the side of value 12.
Hint 2:
Another way to see scale factor here is asking how much would you multiply a side of B by to get the corresponding side of A?

(Since we are looking at how B scales up to A, we notice that A is bigger than B. This means that the scale factor will be greater than 1)
Hint 3:
For these rectangles we ask what do we multiply by 2 to get 5 and does that same number multiply by 4.8 to get 12?
Hint 4:
2 * 2.5 = 5 and 4.8 * 2.5 = 12

So the scale factor is 2.5. Please type in 2.5

28.) "Stretching_and_Shrinking_Inv_4_4" (Problem ID: 14161) TEXT_FIELD

No knowledge components have been assigned



The two triangles are similar. Find the length of the missing side, x.

Answers: (Interface Type: TEXT_FIELD)

✔ **5**

Hint 1:
We need to find the scale factor from the large triangle to the small one. Since the triangle gets smaller we know the scale factor will be less than 1.

Hint 2:
Since the sides 6 and 2 correspond we know that 6 * 1/3 = 2

So the scale factor is 1/3

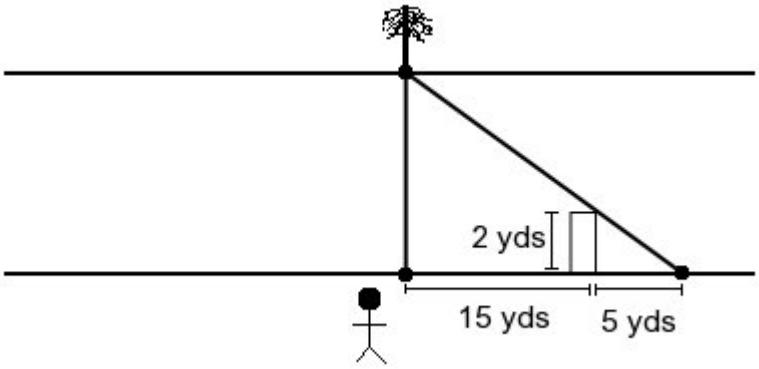
Hint 3:
Now we can use the scale factor of 1/3 to find the missing side length.

Hint 4:
15 * 1/3 = 5

So x = 5. Type in 5

29.) "Stretching_and_Shrinking_Inv_5_1" (Problem ID: 14162) TEXT_FIELD

No knowledge components have been assigned

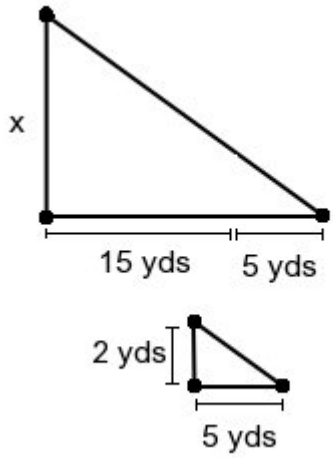


Ben was able to make the measurements given above. He is straight across from the tree, and 15 yards from the dock. The dock is 2 yards long. 5 yards from the dock is where the line that goes from the tree to the end of the dock hits the side of the river. How far is it across the river?

Answers: (Interface Type: TEXT_FIELD)

✔ **8**

Hint 1:



There are two similar triangles in the diagram, one inside the other. They are shown side by side above.

Hint 2:

$$\frac{2}{5} = \frac{x}{20}$$

Set up two proportions to find the value of x, the distance across the river. The example above shows the ratio of the short side to the long side of the triangle. We use 20 because 15 + 5 = 20

Hint 3:

$$\frac{2}{5} = \frac{x}{4*5}$$

$$4*\frac{2}{5} = \frac{x*4}{4*5}$$

Since 5 * 4 = 20, the scale factor from the small triangle to the large triangle is 4. Use this to find the value of x.
Hint 4:
2 * 4 = 8. Please enter 8.

30.) "Stretching_and_Shrinking_Inv_5_2" (Problem ID: 14163) TEXT_FIELD

No knowledge components have been assigned

$$\frac{x}{20} = \frac{10}{4}$$

Find the value of **x** that makes the fraction equivalent.
Answers: (Interface Type: TEXT_FIELD)
✔ **50**

Hint 1:
Solve the equation for x. Start by multiplying both sides by 20 and 4.
Hint 2:

$$\frac{x}{4*5} = \frac{10}{4}$$

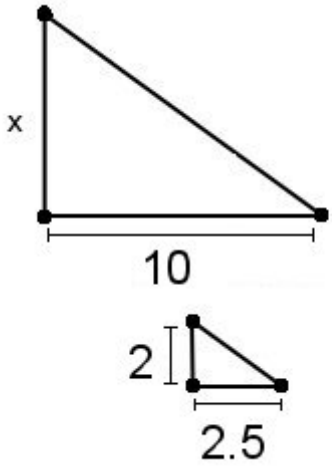
$$\frac{4* x}{4*5} = \frac{10}{4} *4$$

false
Hint 3:
We are then left with x/5 = 10. Multiply both fractions by 5 so the 5 on the bottom cancels out.
Hint 4:
The correct answer is 50. Please enter 50'

31.) "Stretching_and_Shrinking_Inv_5_3" (Problem ID: 14164) ALGEBRA_FIELD

No knowledge components have been assigned
Mr. Kim's class used the shadow method to estimate the height of the soccer goal post. They find that a 2 foot stick casts a 2.5 foot shadow and the soccer goal casts a 10 foot shadow. What is the estimated height of the soccer goal post?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **8**

Hint 1:
Draw a sketch of the situation. Label the sketch with all the information you know.
Hint 2:



Now set up a proportion for the information you know. For this hint we will do pole side over shadow side of the triangle. Set up the proportion and solve.

Hint 3:

$$\frac{10}{2.5} = 4$$

$$\frac{x}{2} = 4$$

Since 10 is 4 times 2.5 the scale factor is 4. Use it to solve for the height of the goal post (labelled x in the sketch)

Hint 4:

Since 2 * 4 is 8, the goal is 8 feet high. Type in 8.

32.) "Growing_1_2" (Problem ID: 14789) RADIO_BUTTON

No knowledge components have been assigned

Which expression is 1 billion?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 10^{12}

✗ B.10^{6}

✓ **C.10^{9}**

✗ D. 1000000

Hint 1:

One hundred is 100

One thousand is 1,000

One million is 1,000,000

One billion is 1,000,000,000

Hint 2:

One hundred is 100 = 10^{2}

One thousand is 1,000 = 10^{3}

One million is 1,000,000 = 10^{6}

One billion is 1,000,000,000 = 10^9
Select 10^9

33.) "Growing_1_1" (Problem ID: 14790) TEXT_FIELD

No knowledge components have been assigned

Type in 1 million. (do not use exponents)

Answers: (Interface Type: TEXT_FIELD)

✔ **1000000**

✔ **1,000,000**

34.) "Growing_1_3" (Problem ID: 14791) ALGEBRA_FIELD

No knowledge components have been assigned

Age	Number of Chores (per week)
10	1
11	
12	

Bill wants to help out around the house. He made a proposal to his parents. At 10 years old, he did 1 chore a week. He promised that each year he will double the number of chores he does a week.

If he uses the table above, doubling the number of chores each year, how many chores will he be doing each week when he is 17?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **128**

Hint 1:

When Bill is 11, he will have 2 chores per week. When he is 12, it will double to 4 chores per week.

Hint 2:

An equation that represents Bill's number of chores per week (C) is:

$C = 2^t$

where **t** is the **difference in his current age and age 10**

So for age 10, we would use t = 0. Age 11, t = 1

Hint 3:

For age 17, we have t = 7

Put 2^7 into your calculator and you will get 128. Please type 128.

35.) "Growing_1_4" (Problem ID: 14792) RADIO_BUTTON

No knowledge components have been assigned

Which of the following is the expression 4?4?4?4?4?4 in exponential form?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 4^5

✓ **B. 4^6**

✗ C. 4^7

✗ D. 4^4

Hint 1:

In exponential form, the superscript number (the small number to the top right of a number) tells you how many multiples there are of the number it is related to.

So for instance, 2^3 = 2?2?2

Hint 2:

We have 6 4's, so it is 4^6. Please select B

36.) "Growing_1_5" (Problem ID: 14793) TEXT_FIELD

No knowledge components have been assigned

What is the exponent **n** in the equation $3^{\mathbf{n}} = 27$?

Answers: (Interface Type: TEXT_FIELD)

✓ **3**

Hint 1:

We need to figure out how many multiples of 3 does it take us to equal 27. This number will be n.

2 multiples of 3: 3^2 = 3?3 = 9 (too small)

5 multiples of 3: 3^5 = 3?3?3?3?3 = 243 (too big)

How many multiples of 3 do we need?

Hint 2:

3^3 = 3?3?3 = 27. Type 3.

37.) "Growing_1_6" (Problem ID: 14794) RADIO_BUTTON

No knowledge components have been assigned

A

x	0	1	2	3	4
y	5	55	105	155	205

B

x	0	1	2	3	4
y	3	6	12	24	48

C

x	0	1	2	3	4
y	4	8	12	24	28

Which table above is exponential?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✓ **B**
✗ C

Hint 1:
For a table to be exponential, as x increases by 1, the new y value will be some multiple of the previous y value. This multiple must be the same no matter which two adjacent x values we pick.
Hint 2:
For example, look at A. For x=1, the y value is 11 times the y value at x = 0. However, For x = 2, the y value is aproximately 2 times the y value of x = 1. So table A clearly cannot be exponential.
Hint 3:
We see that in table B, as x increases by 1, the y value is multipled by 2. This means that table B is exponential. Select B.

38.) "Growing_1_7" (Problem ID: 14795) RADIO_BUTTON

No knowledge components have been assigned

A

x	0	1	2	3	4
y	5	55	105	155	205

B

x	0	1	2	3	4
y	3	6	12	24	48

C

x	0	1	2	3	4
y	4	8	12	24	28

Which table above is **linear**?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A**

✗ B
✗ C

Hint 1:
For a table to be linear, as x increases by 1, the y value should increase by some constant number.
Hint 2:
For table B, we see that as x increases by 1, y increases by 3, 6, and then 12. Clearly, this is not linear.
Hint 3:
Table A has y values increasing by 50 for each increase of x by 1. Table C is not quite linear, because the y values increase by 4, but there is one time that it increases by 12. So select A.

39.) "Growing_1_8" (Problem ID: 14796) RADIO_BUTTON

No knowledge components have been assigned

x	0	1	2	3	4
y	3	6	12	24	48

What is the equation for the exponential graph represented by the table above?
Answers: (Interface Type: RADIO_BUTTON)

✗ A. 3^n
✗ B. $2?3^n$
✓ **C. $3?2^n$**
✗ D. 2^n

Hint 1:
The y values double for each increase of x by 1. So, we are looking for an equation with a y-intercept of 3 and a growth factor of 2.
Hint 2:
The equation that represents the table is $y = 3?2^n$. Please select C.

40.) "Growing_1_9" (Problem ID: 14797) RADIO_BUTTON [MA - 2004 - null - 18]

No knowledge components have been assigned

Which of the following is the number 37,200,000 written in scientific notation?
Answers: (Interface Type: RADIO_BUTTON)

✗ A. 37.2×10^5
✗ B. 372×10^5
✗ C. 3.72×10^8
✓ **D. 3.72×10^7**

Hint 1:
In order to write a number in scientific notation, we first move the decimal point over just to the right of the leading digit. So we have:

3.7200000

This is equivalent to 3.72. Clearly 3.72 and 37,200,000 are not equal, but we can fix this by figuring out how many multiples of 10 we must multiply 3.72 by to get 37,200,000

Hint 2:
We can figure out how many multiples of 10 we need by figuring out how many digits we passed over by moving the decimal point to the right of the leading digit. For a whole number we assume the decimal point starts at the very right:

37200000.

It then moves to the right of the leading digit:

3.7200000

It passes over 7 digits to get to its new location. So we need 7 multiples of 10.
Hint 3:
So we have 3.7200000 which is equivalent to 3.72 being multipled by 10^7

This is 3.72 x 10^7 Please select D

41.) "Growing_2_1" (Problem ID: 14798) RADIO_BUTTON

No knowledge components have been assigned

Santa wants to increase his collection of magic cubes so he puts them in a magic jar. A cube in the jar will become 5 cubes each hour. He starts by putting 3 cubes in the jar. Which equation describes the number of magic cubes (m) in the jar after *t* hours?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. m = 3?t^5

✗ B. m = 5?t^3

✗ C. m = 5?3^t

✓ **D. m = 3?5^t**

Hint 1:
After 0 hours, Santa would have 3 cubes
After 1 hour, Santa would have 3?5 = 15 cubes.
After 2 hours, Santa would have 3?5?5 = 75 cubes.

Hint 2:
Our growth factor is 5, and our initial value is 3. So, we have m = 3?5^t. Please select D.

42.) "Growing2_2" (Problem ID: 14799) TEXT_FIELD

No knowledge components have been assigned

Santa wants to increase his collection of magic cubes so he puts them in a magic jar. A cube in the jar will become 5 cubes each hour. He starts by putting 3 cubes in the jar.

m = 3?5^t is the equation for how many magic cubes will be in the jar after t hours. How many magic cubes will Santa have after 4 hours?

Answers: (Interface Type: TEXT_FIELD)

✓ **1875**

Hint 1:
Substitute in 4 for t and solve for m by simplifying.

Hint 2:
So we have,
$m = 3?5^t$
$m = 3?5^4$
Hint 3:
m = 3?5?5?5?5
m = 1875

Type 1875

43.) "Growing2_3" (Problem ID: 14800) TEXT_FIELD [MA - 2004 - - 18]

No knowledge components have been assigned

Santa wants to increase his collection of magic cubes so he puts them in a magic jar. A cube in the jar will become 5 cubes each hour. He starts by putting 3 cubes in the jar.

$m = 3?5^t$ is the equation for how many magic cubes will be in the jar after t hours. After how many hours will he have *at least* 10,000?

Answers: (Interface Type: TEXT_FIELD)

✓ **6**

Hint 1:
After 1 hour, m = 3?5 = 15 (not enough)
After 2 hours, m = 3?5?5 = 75 (not enough)
After 3 hours, m = 3?5?5?5 = 375 (not enough)
Hint 2:
After 4 hours, m = 3?5?5?5?5 = 1875 (not enough)
After 5 hours, m = 3?5?5?5?5?5 = 9375 (almost...)
Hint 3:
After 6 hours, m = 3?5?5?5?5?5?5 = 46875 (First one over 10,000)

Please type 6.

44.) "Growing2_4" (Problem ID: 14801) TEXT_FIELD

No knowledge components have been assigned

Bill is interested in predicting the length of his baby pet snake. When the snake hatched it was 4 inches long. Bill measured it after 1 week and it was 8 inches long. If the snake is growing **exponentially**, how long would we expect it to be at 2 weeks?

Answers: (Interface Type: TEXT_FIELD)

✓ **16**

Hint 1:
Since we know Bill's snake grows exponentially, it would help to find out what the growth factor is. This is the number we multiply the length by for each period of time.

Since the snake became 2 times as long in one week and it grows exponentially, we know that the growth factor is 2.
Hint 2:
We know the snake grows twice as long each week and we know that he is 8 inches long after one

week. So the next week he will be 16 inches. Please type 16.

45.) "Growing2_5" (Problem ID: 14802) TEXT_FIELD

No knowledge components have been assigned

Bill is interested in predicting the length of his baby pet snake. When the snake hatched it was 4 inches long. Bill measured it after 1 week and it was 8 inches long. If the snake is growing **linearly**, how long would we expect it to be at 2 weeks?

Answers: (Interface Type: TEXT_FIELD)

✔ **12**

Hint 1:

Since Bill's snake grows linearly, we know that it will grow by a constant number each week. We see that after 1 week, Bill's snake grows by 4 inches.

Since it grows linearly, we can expect the snake to grow another 4 inches for the second week. How long will he be after 2 weeks?

Hint 2:

He will be 8+4 = 12 inches long. Please enter 12

46.) "Growing2_6" (Problem ID: 14803) TEXT_FIELD

No knowledge components have been assigned

What is the growth factor of this equation?

$y = 40(4^x)$

Answers: (Interface Type: TEXT_FIELD)

✔ **4**

Hint 1:

The growth factor is the number that the exponential variable is attached to.

Hint 2:

4 is the number related to the exponential variable so it is the growth factor. Type 4.

47.) "Growing2_7" (Problem ID: 14804) TEXT_FIELD

No knowledge components have been assigned

What is the **y-intercept** of this equation?

$y = 40(4^x)$

Answers: (Interface Type: TEXT_FIELD)

✔ **40**

Hint 1:

The y-intercept is the value of y when x = 0. Substitute 0 in for x, and then solve for y.

Hint 2:

$4^0 = 1$.

So,

y = 40*1 = 40

Please enter 40

48.) "Growing4_1" (Problem ID: 14805) RADIO_BUTTON

No knowledge components have been assigned

Pick the equation that represents exponential decay.

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $y = .4(.3x)$

✗ B. $y = .8(2.1)^x$

✓ **C. $y = 4(.7)^x$**

✗ D. $y= .3(1.2x)$

Hint 1:

Equations with exponential decay have a growth factor of less than 1. Which one of the above equations is both exponential and has a growth factor of less than 1?

Hint 2:

Answer choice C has a growth factor of .7 and is exponential. Select C

49.) "Growing4_2" (Problem ID: 14806) ALGEBRA_FIELD

No knowledge components have been assigned

Mr. Johnson wants to give $1000 to his 8 grandchildren. The oldest gets 1/2 of the $1000 then each child after that gets 1/2 of what is left.

If he continues from the oldest to the youngest, how much money will the *fourth* oldest grandchild get?

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **62.5**

Hint 1:

The oldest grandson gets half of the $1000 so he takes $500. There is now $500 left.

The 2nd oldest grandson gets half of the $500 left. He takes $250 and there is now $250 left.

The 3rd oldest grandson gets half of the $250 that is left. He takes $125 and there is now $125 left.

Hint 2:

The 4th oldest grandson gets half of the $125. This is $62.5. Please enter 62.5

50.) "Growing4_3" (Problem ID: 14807) TEXT_FIELD [MA - 1999 - null - 11]

No knowledge components have been assigned

Mr. Johnson wants to give $1000 to his 8 grandchildren. The oldest gets 1/2 of the $1000 then each child after that gets 1/2 of what is left.

What is the decay rate as a percentage of the initial $1000 as each child takes their portion?

Answers: (Interface Type: TEXT_FIELD)

✓ **50%**

✓ **50**

Hint 1:

The decay rate is also the growth factor. The amount of money is shrinking so we have exponential decay. This means the growth factor is less than 1.

Hint 2:
The growth factor is 1/2 or .5. This is also 50% Please enter 50

51.) "Growing5_1" (Problem ID: 14808) RADIO_BUTTON [MA - 2003 - null - 33]

No knowledge components have been assigned

What number is equal to 4^5*4^7?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 8^{12}

✓ **B. 4^{12}**

✗ C. 8^{35}

✗ D. 16^{35}

Hint 1:
This is the same as saying (4*4*4*4*4)*(4*4*4*4*4*4*4)

Hint 2:
We have 4*4*4*4*4*4*4*4*4*4*4*4. There are 12 4's. So we have 4^{12}

52.) "Growing5_2" (Problem ID: 14809) RADIO_BUTTON

No knowledge components have been assigned

What number is equal to $(2^5)^4$

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 2^9

✗ B. 10^4

✓ **C. 2^{20}**

✗ D. 40

53.) "Growing5_3" (Problem ID: 14810) RADIO_BUTTON

No knowledge components have been assigned

Which number is equal to 5^7?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. (5*5*5)(5*5*5)

✗ B. (5*7)(5*7)(5*7)(5*7)

✗ C. 7*7*7*7*7

✓ **D. (5*5)(5*5*5*5*5)**

Hint 1:
This means we multiply 7 5's together. Which of the answer choices reflects this?

Hint 2:
Answer choice D has 7 5's being multiplied together. Select D

54.) "Growing3_1" (Problem ID: 14910) TEXT_FIELD

No knowledge components have been assigned

x	1	2	3	4
y	30	150	750	…

The table above shows exponential growth. What is the growth factor?
Answers: (Interface Type: TEXT_FIELD)
✔ **5**

Hint 1:
The growth factor is the number we multiply our current y value by when we increase x by 1.
From x = 1 to x = 2, what do we multiply 30 by to get 150?
Hint 2:
Our growth factor is 5. 30*5 = 150 and 150*5 = 750. Enter 5.

55.) "Growing3_2" (Problem ID: 14911) TEXT_FIELD

No knowledge components have been assigned

x	1	2	3	4
y	30	150	750	…

The table above shows exponential growth. What is the y-intercept?
Answers: (Interface Type: TEXT_FIELD)
✔ **6**

Hint 1:
The y-intercept is the value of y when x = 0. The closest value to x = 0 is x = 1.

We know the growth factor is 5. We also know that we multiplied the value of y when x = 0 by 5 to get the value of y when x = 1.

In other words, what did we multiply by 5 to get 30?
Hint 2:
6*5 = 30. So the y-intercept is 6. Enter 6.

56.) "Growing3_3" (Problem ID: 14912) RADIO_BUTTON

No knowledge components have been assigned

x	1	2	3	4
y	30	150	750	…

Which is the exponential equation for the table above?
Answers: (Interface Type: RADIO_BUTTON)
✘ A. $y = 30^x$
✘ B. $y = 5?6^x$
✘ C. $y = 6 + 5^x$
✔ **D. $y = 6?5^x$**

Hint 1:
In previous questions we found that the y-intercept is 6 and the growth factor is 5.

We write an exponential equation based on these two numbers. In fact,

$y = (\text{y-intercept})?(\text{growth factor})^x$
Hint 2:
So,

$y = 6?5^x$

57.) "Growing3_4" (Problem ID: 14914) TEXT_FIELD

No knowledge components have been assigned

The population growth of a special type of fish is given by the equation $p = 350?(1.2)^t$ where t is the number of years. In how many years will the population be at least triple the original?
Answers: (Interface Type: TEXT_FIELD)
✔ **7**

Hint 1:
In other words, we wish to know the value of t such that 1.2^t is **at least** 3 (no less!)

Try plugging in different values of t in for 1.2^t on your calculator. What is the smallest value of t that makes 1.2^t over 3?
Hint 2:
1.2^6 gets us 2.986 which is not quite 3. However, 1.2^7 is 3.58. So 7 is the smallest value of t that makes 1.2^t greater than 3. Enter 7.

58.) "Growing3_5" (Problem ID: 14915) TEXT_FIELD

No knowledge components have been assigned

If the growth factor in an exponential situation is 1.7, what percent is the growth rate?
Answers: (Interface Type: TEXT_FIELD)
✔ **70%**
✔ **70**

Hint 1:
Unlike the growth factor, the growth rate is just the percentage of the increase of the population from the original population.

For example with a growth rate of 2. We will double the population. So there will exist the original amount of objects plus a 100% increase.
Hint 2:
For a growth factor of 1.7. For each period of time, we retain the current amount plus increase that amount by 70%. Enter 70

59.) "Growing3_6" (Problem ID: 14916) TEXT_FIELD

No knowledge components have been assigned

If the growth rate is 42% in an exponential situation, what is the growth factor?
Answers: (Interface Type: TEXT_FIELD)
✔ **1.42**

Hint 1:
If our growth rate is 42%, this means we keep 100% of the population and add another 42%.
Hint 2:
Change the percentages to decimal numbers as we represent growth rate as a decimal. 1 + .42 = 1.42.

Enter the growth factor, 1.42

60.) "Growing3_7" (Problem ID: 14917) TEXT_FIELD

No knowledge components have been assigned
Assume the number of iPods owned in the US increases by a rate of 14% each year. If there are 100,000 now. How many will there be in 5 years?
Answers: (Interface Type: TEXT_FIELD)
✔ **192541**

Hint 1:
The first step is to find the growth factor and y-intercept.

The y-intercept, or initial value, is given as 100,000. We are given the growth factor as a growth rate. We know that the growth factor can be determined by the growth rate by adding 100% and changing it to a decimal number. However, growth factor is represented by a decimal number. So we have 1 + .14 = 1.14. 1.14 is the growth rate.
Hint 2:
We should have the equation now:

$y = (100000)?(1.14)^t$

Substitute in 5 for t.
Hint 3:
$y = (100000)?(1.14)^5 = 192541$. Please enter 192541

End Linear Section
End Linear Section

Module Name: 10thGradeMZ-Quiz

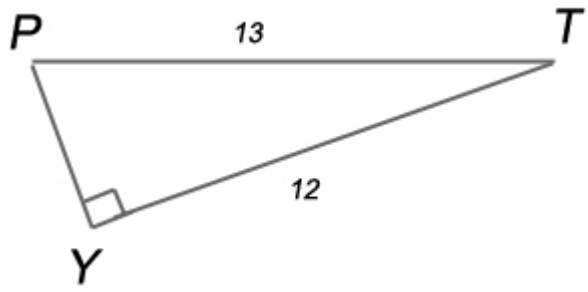
Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section

Begin Random Order Section

1.) "Looking for Pythagoras Investigation 4 #3" (Problem ID: 13992) TEXT_FIELD

No knowledge components have been assigned



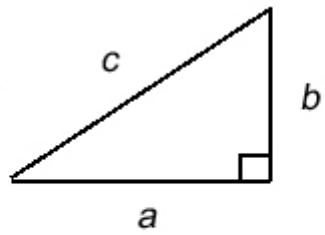
How long is side PY in the right triangle?

Answers: (Interface Type: TEXT_FIELD)

✓ **5**

Hint 1:
The length of the hypotenuse and one leg has been given to you. Using the Pythagorean Theorem, you can solve for the last leg!

Hint 2:



$a^2 + b^2 = c^2$

The Pythagorean Theorem is shown above. Plug in the length of the hypotenuse and one leg into the equation, and solve for the unknown variable!

Hint 3:
What is x in the equation:
$13^2 = x^2 + 12^2$

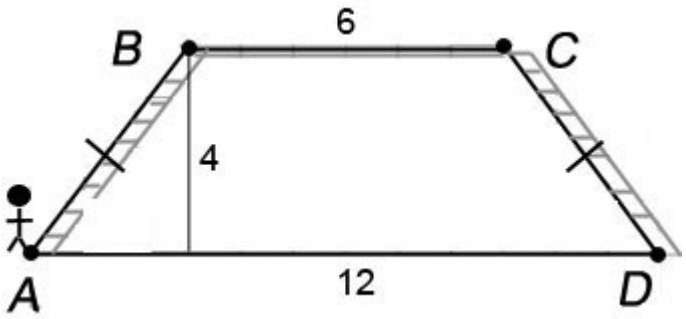
Hint 4:
Simpifying the equation gives you:
$169 = x^2 + 144$

Hint 5:

By subtracting both sides of the equation by 144, you get the equation: $x^2 = 25$
Hint 6:
Taking the square root of both sides of the equation gives you the value of x.
Hint 7:
The square root of 25 is 5. Therefore, x = 5. Type in 5.

2.) "Looking for Pythagoras Investigation 4 #2" (Problem ID: 13991) TEXT_FIELD [MA - 2000 - Spring - 5]

No knowledge components have been assigned



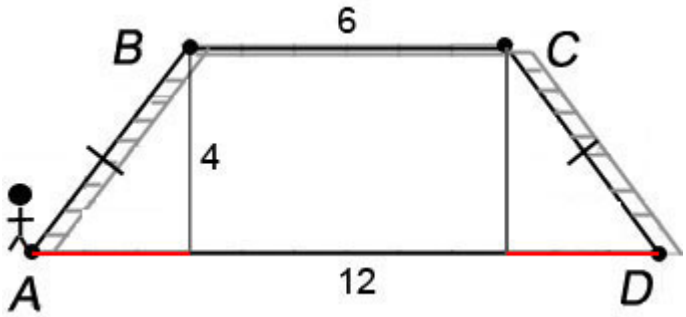
A climber at a park looks like the picture above.

If a kid climbs from A to B to C to D, how far has she climbed?

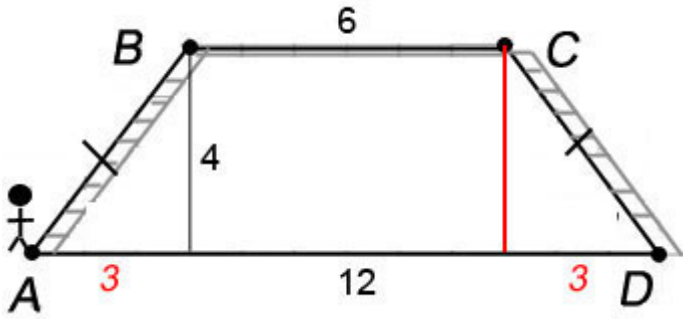
Answers: (Interface Type: TEXT_FIELD)

✔ **16**

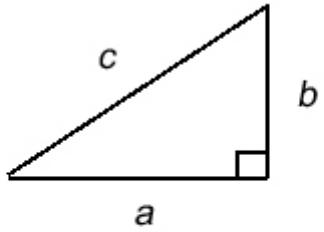
Hint 1:
To find the distance from A to B to C to D, you need to find the length of AB, BC, and CD. The length of BC is given to be 6. You can find the length of AB and CD using the Pythagorean Theorem. First, you must find the length of the unknown leg.
Hint 2:



The length of the line segments labeled in red are equal to each other because the angles on each end are equal to each other. The sum of the two red line segments can be found by subtracting the top length from the bottom length.
Hint 3:



If you subtract the top length from the bottom length, you get 6. If the sum of the two equal red segments is 6, then each red segment has a length of 3. Now that you have the length of the unknown, find the length of AB using the pythagorean theorem.
Hint 4:



$a^2 + b^2 = c^2$

Plugging in the length of the legs into the pythagorean theorem gives you the equation:
c? = 3? + 4?
Solve for c.
Hint 5:
Simplifying the equation gives you:
c? = 9 + 16 = 25
Taking the square root of both sides gives you the value of c:
c = 5.
Now that you have found the length of AB, you need to find the length of CD.
Hint 6:
The length of CD is the same as AB because the length of the legs of the right triangle it creates is the same as the length of the legs of the right triangle created by AB. Since AB's length is 5, the length of CD is also 5.
Hint 7:
To find the distance from A to B to C to D, you need to find the sum of the length of AB, BC, and CD.
Hint 8:
AB + BC + CD = 5 + 6 + 5 = 16. The distance from A to B to C to D is 16. Type in 16.

3.) "Looking for Pythagoras Investigation 4 #1" (Problem ID: 13990) RADIO_BUTTON [MA - 2000 - Spring - 5]

No knowledge components have been assigned

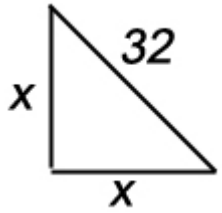
The hypotenuse of a right isoceles triangle is 32 feet. How long is one leg of this triangle?

Answers: (Interface Type: RADIO_BUTTON)

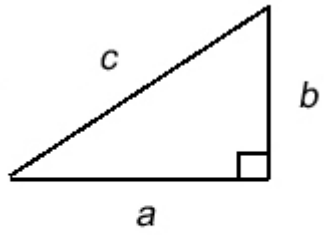
✔ **√512**

✗ √64
✗ 4
✗ 512

Hint 1:
Start by drawing a picture of this triangle.
Hint 2:



The triangle you drew should look like this since it is both a right triangle and a isoceles triangle.
An isoceles triangle has two equal sides.
Hint 3:

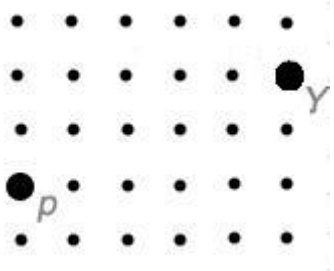


$a^2 + b^2 = c^2$

Using the pythagorean theorem, find the length of one leg.
Hint 4:
Solve for x in this equation:
32? = x? + x?
Hint 5:
Simplifying the equation gives you:
1024 = 2* x?
Hint 6:
Further simplifying the equation gives you: x? = 1024 / 2 = 512
Hint 7:
Taking the square root of both sides gives you:
x = √512.
Choose the answer choice √512.

4.) "Looking for Pythagoras Investigation 3 #4" (Problem ID: 13989) RADIO_BUTTON [MA - 2000 - Spring - 5]

No knowledge components have been assigned



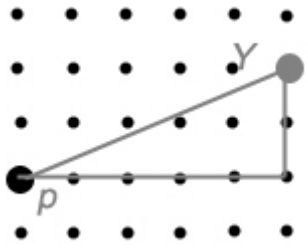
Use the pythagorean theorem to find the distance from point P to point Y. What is the distance from point P to point Y?

Answers: (Interface Type: RADIO_BUTTON)

✗ √10
✓ **√29**
✗ √12
✗ 29

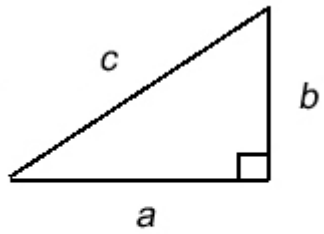
Hint 1:
Start by drawing the line PY and the right triangle it forms.

Hint 2:



Your picture should look like this. Now use the Pythagorean Theorem to find the distance between the two points.

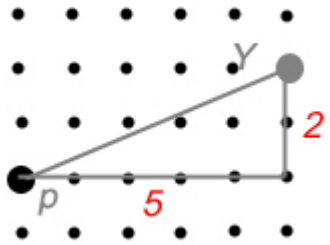
Hint 3:



$a^2 + b^2 = c^2$

The Pythagorean Theorem is shown above. You need to find the length of the legs in order to use it.

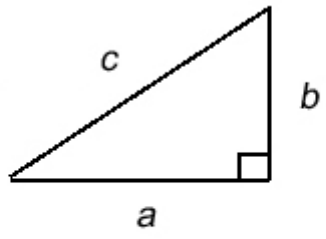
Hint 4:



The length of the legs are 2 and 5. Plug the leg lengths into the Pythagorean Theorem and find the length of **c**, the hypotenuse.
Hint 5:
Plugging in the length of the legs gives you the equation: c? = 2? + 5?
Solve for the value of **c**.
Hint 6:
c? = 2? + 5? = 4 + 25 = 29
c? = 29
Solve for c by taking the square root of both sides of the equation.
Hint 7:
Taking the square root of both sides of the equation gives you the value of c:
c = √29.
Choose the answer choice for √29.

5.) "Looking for Pythagoras Investigation 3 #3" (Problem ID: 13986) RADIO_BUTTON

No knowledge components have been assigned
Which set of lengths would make a right triangle?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 5, 10, 15
✗ B. 6, 4, 5
✓ **C. 3, 4, √7**
✗ D. 5, √15, 3
Hint 1:



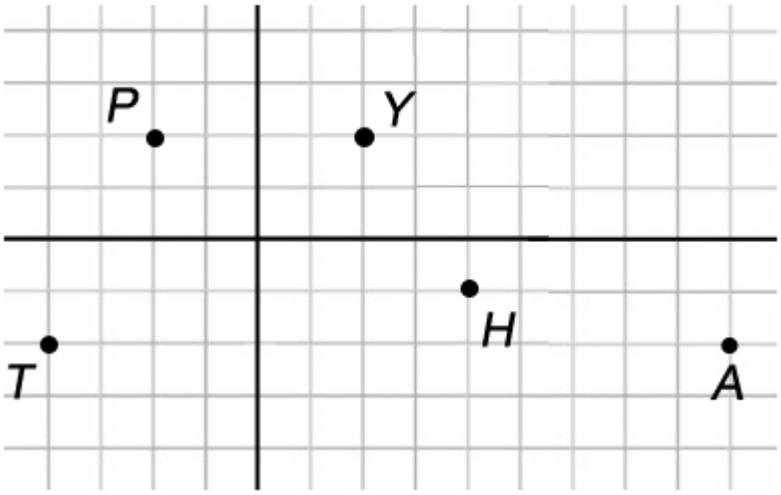
$a^2 + b^2 = c^2$

Use the Pythagorean Theorem to check each answer choice.
Hint 2:
If 5, 5, 10 is a right triangle then the Pythagorean theorem will be true and the sum of the squares of the short sides will equal the square of the long side.
Hint 3:
Since 5? + 4? = 25 + 25 = 50 does not equal 10? = 100 this is not a right triangle.

Hint 4:
If 4, 5, 6 is a right triangle then the Pythagorean theorem will be true and the sum of the squares of the short sides will equal the square of the long side.
Hint 5:
Since 4? + 5? = 16 + 25 = 41 does not equal 6? = 36 this is not a right triangle.
Hint 6:
If 3, 4, √7 is a right triangle then the Pythagorean theorem will be true and the sum of the squares of the short sides will equal the square of the long side.
Hint 7:
Since 3? + (√7)? = 9 + 7= 16 is equal to 4? = 16 this is a right triangle! This is the correct answer. Choose answer choice C.

6.) "Looking for Pythagoras Investigation 3 #2" (Problem ID: 13985) RADIO_BUTTON

No knowledge components have been assigned

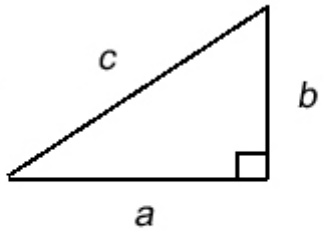


Which two points have a distance between them of √13?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. P and Y
✗ B. H and A
✗ C. T and A
✓ **D. Y and H**

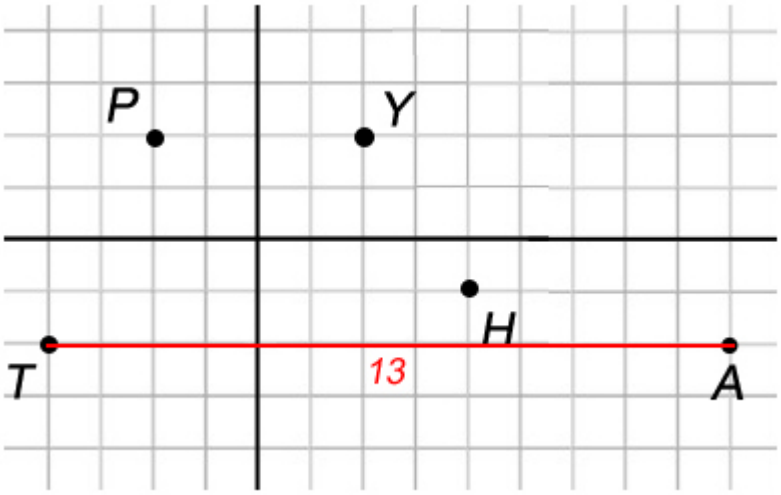
Hint 1:



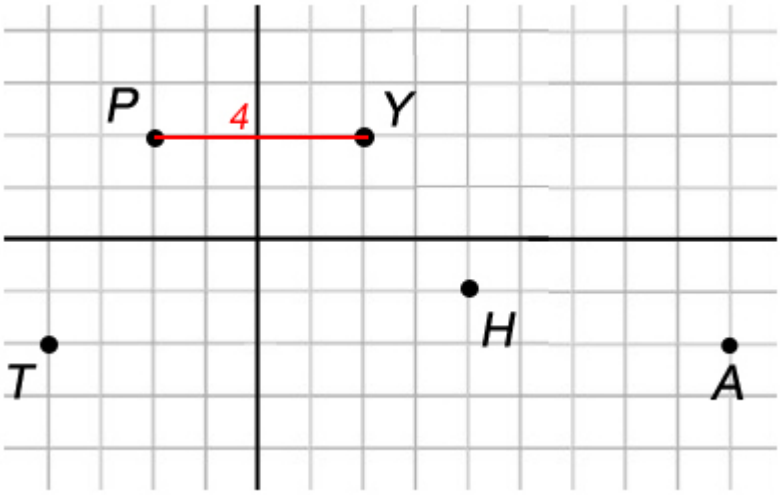
$a^2 + b^2 = c^2$

Examine the lengths between each pair provided as an answer choice by using the Pythagorean

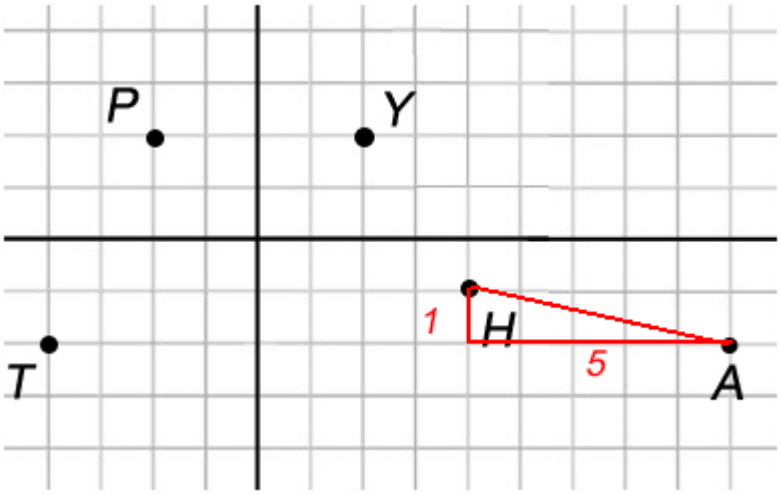
Theorem shown above.
Hint 2:



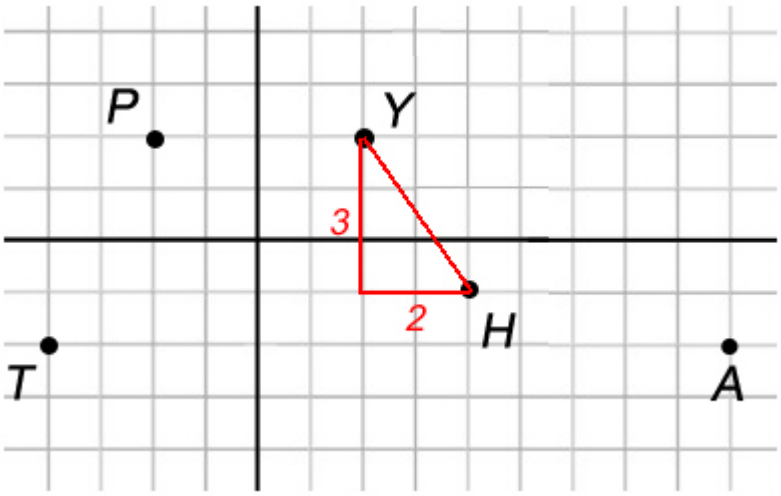
The distance between P and Y is 13 squares. That is greater than √13. This is not the correct answer choice.
Hint 3:



The distance between P and Y is 4 squares. That is greater than √13.
Hint 4:



The distance between H and A, c, is given by the equation:
$c^2 = 1^2 + 5^2$
Solve for the value of c. Start by simplifying the right hand side.
Hint 5:
Now that you have simplified the equation to this:
$c^2 = 1 + 25 = 26$
Solve for c by taking the square root of both sides.
Hint 6:
This gives you: $c = \sqrt{26}$
This is greater than $\sqrt{13}$, this is not the correct answer. Try the next answer choice. Try a shorter line segment.
Hint 7:

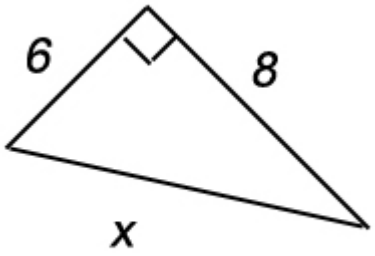


The distance between Y and H, c, is given by the equation:
$c^2 = 2^2 + 3^2$
Solve for the value of c. Start by simplifying the right hand side.
Hint 8:
Now that you have simplified the equation to this:
$c^2 = 4 + 9 = 13$
Solve for c by taking the square root of both sides.
Hint 9:

This gives you: c = √13
The distance between Y and H is √13! This is the correct answer choice! Choose answer choice D. Y and H

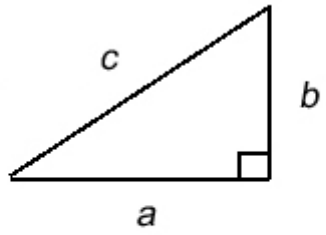
7.) "Looking for Pythagoras Investigation 3 #1" (Problem ID: 13984) TEXT_FIELD

No knowledge components have been assigned



What is the length of the hypotenuse of the right triangle shown above?
Answers: (Interface Type: TEXT_FIELD)
✔ **10**

Hint 1:



$a^2 + b^2 = c^2$

The Pythagorean Theorem is shown above. The values of a and b are given as 6 and 8 respectively. Plus in the values of a and b into the Pythagorean Theorem and solve for c.
Hint 2:
After plugging in the values of a and b, you get the equation:
c? = 6? + 8?

Simplify the equation by finding the squares of 6 and 8 and adding them.
Hint 3:
After simplifying the right hand side of the equation, you get the equation:
c? = 36 + 64
or
c? = 100

Take the square root of both sides to find the value of c.
Hint 4:

c = √100
Hint 5:
The value of c is the √100. The square root of 100 is 10. Type in 10.

8.) "Looking for Pythagoras Investigation 2 #5" (Problem ID: 13983) RADIO_BUTTON

No knowledge components have been assigned

Which of the answer choices shows the following numbers arranged from least to greatest?

8.1 √80 √45 7.2 −5 −√24

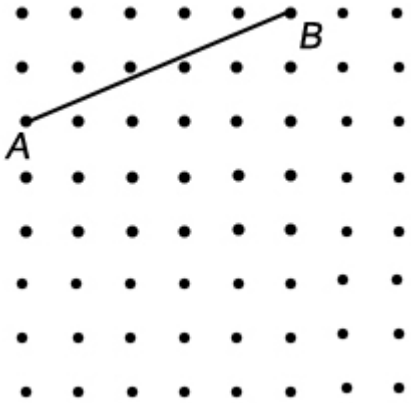
Answers: (Interface Type: RADIO_BUTTON)

✗ A. -√24, -5, 7.2, 8.1, √45, √80
✓ **B. -5, -√24, √45, 7.2, 8.1, √80**
✗ C. -5, 7.2, 8.1, -√24, √45, √80
✗ D. -√24, -5, √45, √80, 7.2, 8.1

Hint 1:
Lets estimate all the square roots first:
√80 is a little less than 9 since $9^2 = 81$
√45 is a little less than 7 since $7^2 = 49$
-√24 is a little more than -5 since $5^2 = 25$
Hint 2:
First lets find the smallest value. The negative ones are going to be the smallest, lets compare -5 and -√24. -√24 is a little more than -5. That means -5 is the smallest value.
Hint 3:
-√24 is the only other negative number besides -5, that means it is the second smallest number.
Hint 4:
Of the positive values remaining, √45 is the smallest one since it is a little less than 7.2 That makes √45 the third value.
Hint 5:
Now we know that the only answer choice with -5, -√24, and √45 as the first three values is the right choice.
Hint 6:
The only answer choice with the first three values correctly in order from smallest to largest is choice B. Select B.

9.) "Looking for Pythagoras Investigation 2 #4" (Problem ID: 13982) RADIO_BUTTON

No knowledge components have been assigned



How long is the line segment AB?

Answers: (Interface Type: RADIO_BUTTON)

✔ **√29**

✘ 5

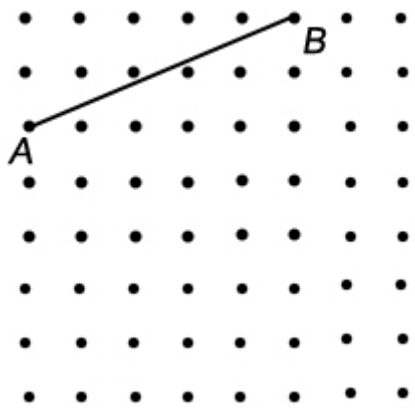
✘ 4

✘ √20

Hint 1:

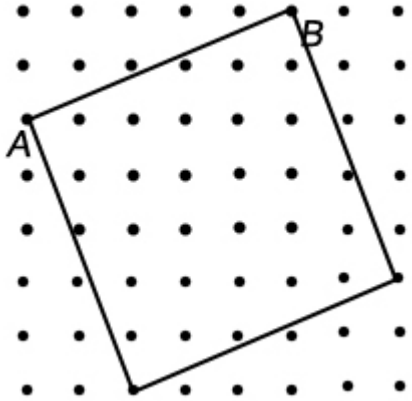
Start by drawing a square whose side is AB. The length of AB is the square root of the area of the square.

Hint 2:

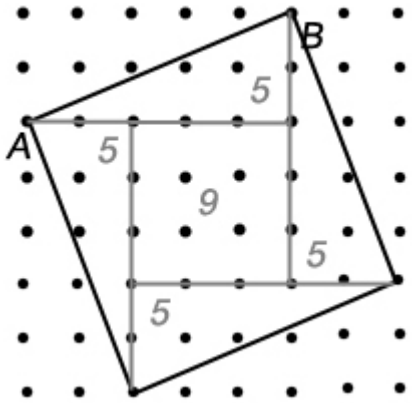


To draw the next side of the square, we first notice that to get from A to B, you move 2 up and then 5 to the right. The next side is perpendicular to AB, and so the slope is the opposite reciprocal. You move 2 to the right and 5 down from the point B.

Hint 3:



This is what the square looks like. Divide the square into smaller pieces and find the area.
Hint 4:



Here is the square divided. Add up the pieces to find the area. The length of AB is the square root of the area.
Hint 5:
The area of the square is 5 + 5 + 5 + 5 + 9 = 29
Hint 6:
If the area of the square is 29, then the length of the side AB must be the √29. Choose √29.

10.) "Looking for Pythagoras Investigation 2 #3" (Problem ID: 13981) TEXT_FIELD

No knowledge components have been assigned
What is the **smallest** whole number **greater** than √85?
Answers: (Interface Type: TEXT_FIELD)
✔ **10**

Hint 1:
Start by writing out the square of whole numbers.
Hint 2:
$6^2 = 36$
$7^2 = 49$
$8^2 = 64$
$9^2 = 81$
$10^2 = 100$
Hint 3:
Since 100 is the **closest** square **greater** than 85, the **closest** whole number **greater** than √85 is 10.

Type in 10.

11.) "Looking for Pythagoras Investigation 2 #2" (Problem ID: 13980) TEXT_FIELD

No knowledge components have been assigned

What is the largest whole number less than $\sqrt{85}$?

Answers: (Interface Type: TEXT_FIELD)

✔ **9**

Hint 1:

Start by writing out the square of whole numbers

Hint 2:

$6^2 = 36$

$7^2 = 49$

$8^2 = 64$

$9^2 = 81$

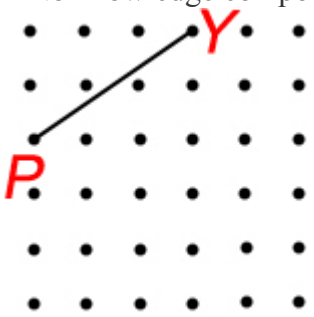
$10^2 = 100$

Hint 3:

Since 81 is the closest square less than 84 the closest whole number less than $\sqrt{84}$ is 9. Type in 9.

12.) "Looking for Pythagoras Investigation 2 #1" (Problem ID: 13979) TEXT_FIELD

No knowledge components have been assigned

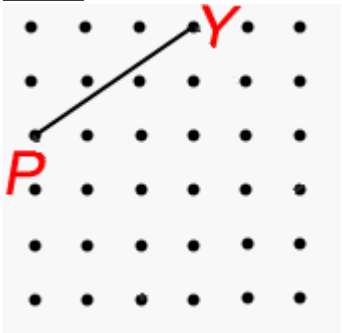


Draw a square with side PY. What is the area of that square?

Answers: (Interface Type: TEXT_FIELD)

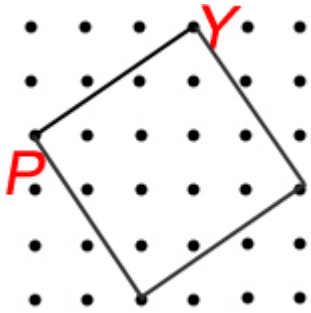
✔ **13**

Hint 1:

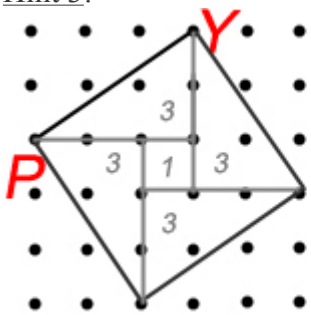


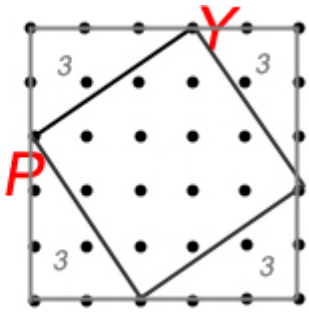
To draw the next side of the square, we first notice that to get from P to Y, you move 2 up and then 3 to the right. The next side is perpendicular to PY, and so the slope is the opposite reciprocal. So you move 2 to the right and 3 down from the point Y.

Hint 2:



This is what the square looks like. Find the area.
Hint 3:

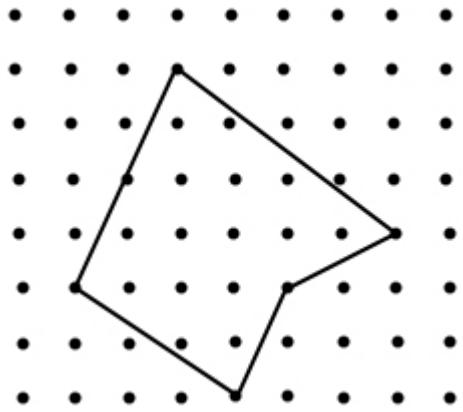




Here are two possible ways to find the area of the square.
Hint 4:
The area of the square is the sum of the areas of the smaller pieces inside it. There are 4 triangles of area 3, and a square of area 1. Square Area = 4 * 3 + 1. Another way to find the area is to subtract the excess space from the bigger square around the image. We can see that the bigger square has side lengths of 5. So the area of the square is 5*5=25. Then there are 4 excess triangles of area 3. Square Area = 25 - 4 * 3.
Hint 5:
25 - 4 * 3 = 13
-or-
3 * 4 + 1 = 13
The answer is 13. Type in 13.

13.) "Looking for Pythagoras Investigation 1 #5" (Problem ID: 13978) TEXT_FIELD

No knowledge components have been assigned

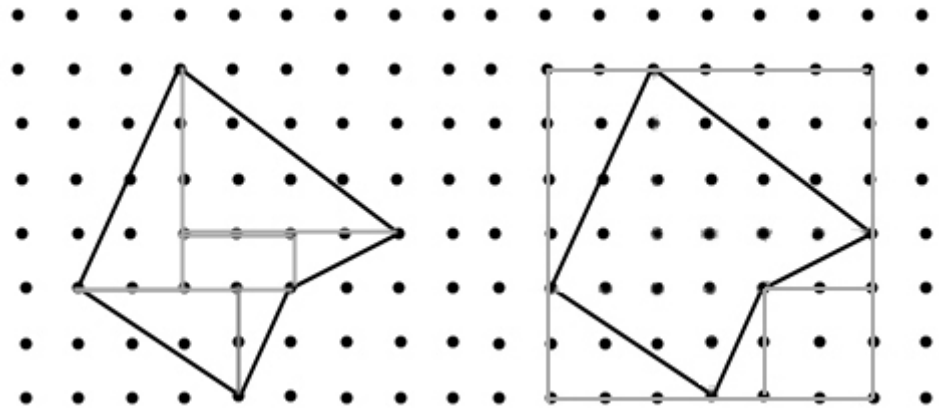


Find the area of the figure shown above.

Answers: (Interface Type: TEXT_FIELD)

✔ **17**

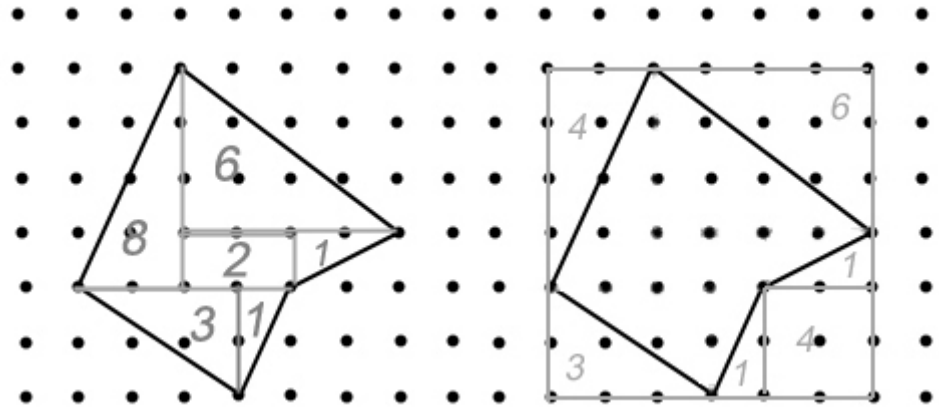
Hint 1:



To find the area you need to divide it up into shapes that are easy to find the area of.

The first image above shows one way that it can be divided.
The second one shows a square around the shape, and divisions of the excess area. If you subtract the excess area from the square's area, you find the area of the shape.

Hint 2:



The areas of the smaller pieces are shown in this image.

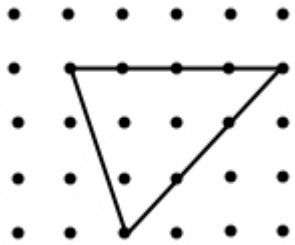
For the first image, add them up to find the total area.
For the second image, add up the areas and subtract it from the area of the large square, 36.

Hint 3:

The area of the triangle is 6 + 4 + 3 + 2 + 1 + 1 = 17.
or
The area of the triangle is 36 - (4 + 6 + 3 + 4 + 1 + 1) = 17
Type in 17.

14.) "Looking for Pythagoras Investigation 1 #4" (Problem ID: 13977) TEXT_FIELD

No knowledge components have been assigned

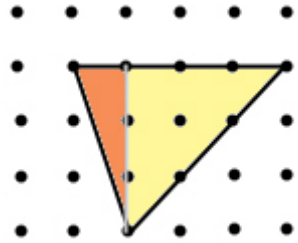


What is the area of the triangle shown above?

Answers: (Interface Type: TEXT_FIELD)

✔ **6**

Hint 1:

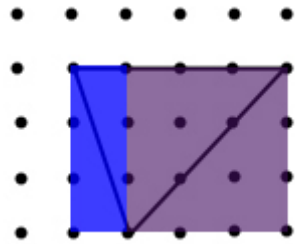


To find the area of this triangle, it is easiest to start by dividing the triangle into parts that are easier to find the area of. The image above shows one such division. Find the areas of the two smaller triangles and add them together to find the answer.

Hint 2:

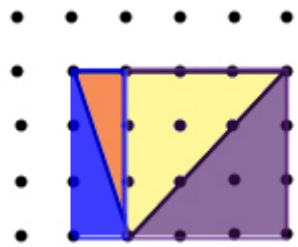
The area of the orange triangle can be found by using the triangle area formula: 1/2 * base * height. The base is 1, and the height is 3. Find the area of the yellow triangle in the same way, then add them together.

Hint 3:



The area of the orange triangle is 1/2 * 1 * 3 = 1.5 (see blue rectangle that is 1x3). The base and height of the yellow triangle are both 3. Find the area of the yellow triangle (take 1/2 of the purple rectangle that is 3*3) and add it to the area of the orange triangle, 1.5.

Hint 4:



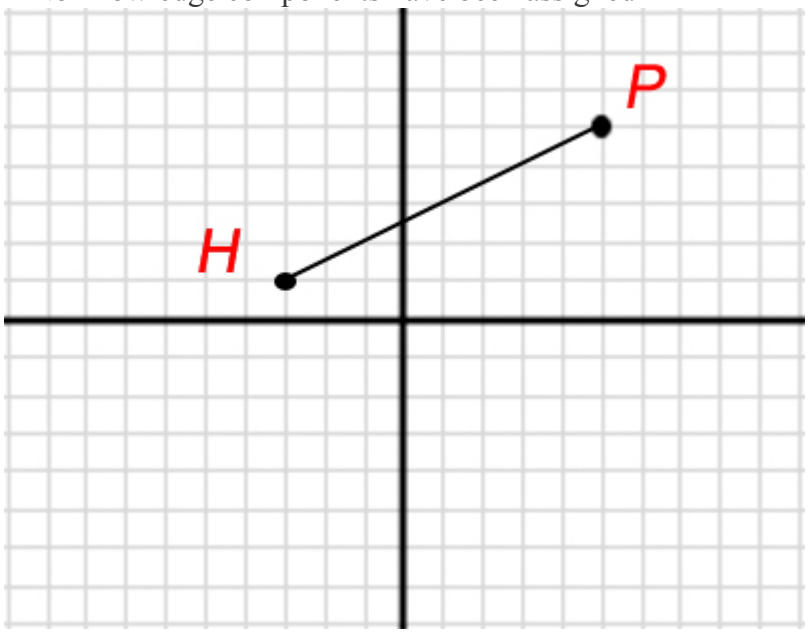
The area of the orange triangle is 1.5 The area of the yellow triangle is 1/2 * 3 * 3 = 4.5. The total area of the triangle is 6

Hint 5:

What is 1.5 + 4.5?
Hint 6:
The area of the triangle is 6.

15.) "Looking for Pythagoras Investigation 1 #3" (Problem ID: 13976) RADIO_BUTTON

No knowledge components have been assigned



Suppose you want to place two points Y and T on the graph such that PYTH is a nonrectangular parallelogram. Which of these possibilities would work for T and Y?

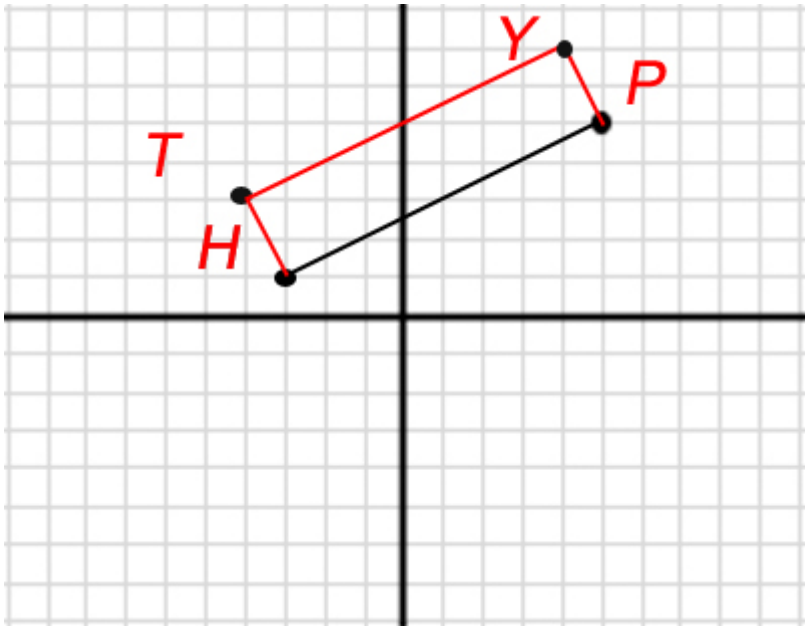
Answers: (Interface Type: RADIO_BUTTON)

✗ A) T = (-4, 3) Y = (4, 7) *Notice that the slope of TH and TY are opposite reciprocal. (The slope of TY is 1/2 and the slope of YP is -2/1) This means that they form a right angle. That makes this version of PYTH a rectangle. We are looking for a solution that is nonrectangular.*

✓ **B) T = (0, -2) Y = (8, 2)**

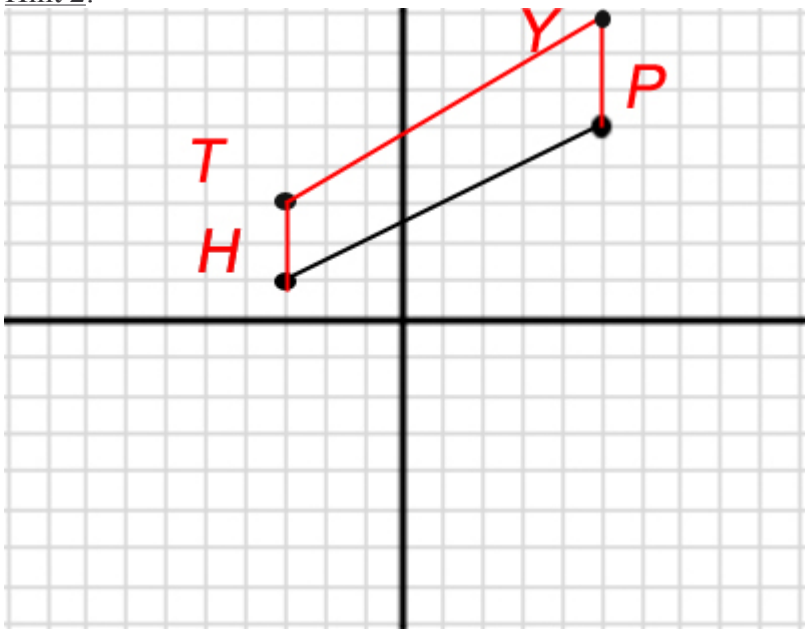
✗ C) T = (-3, 3) Y = (5, 8) *The lengths of TH and YP are not equal. This is not a parallelogram.*

Hint 1:



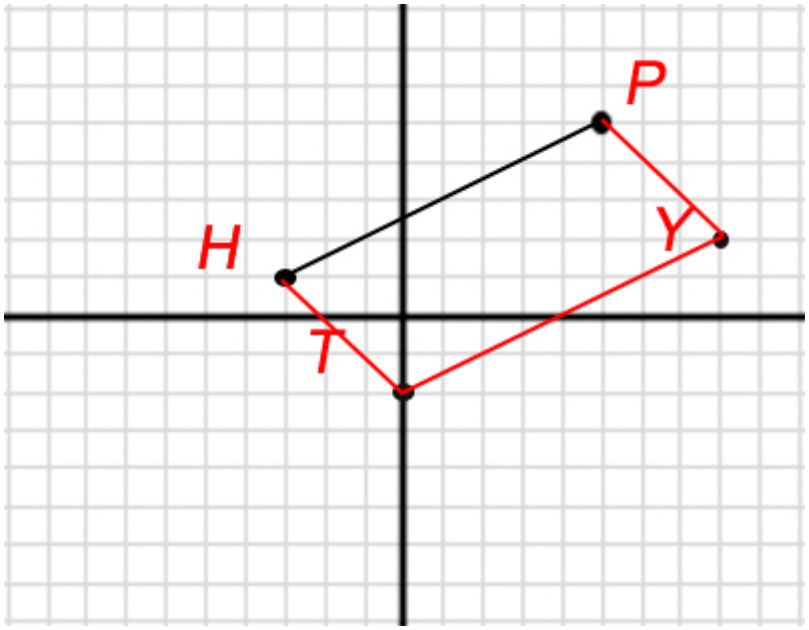
This is a drawing of option A. Notice that the slope of TH and TY are opposite reciprocal. (The slope of TY is 1/2 and the slope of YP is -2/1) This means that they form a right angle. That makes this version of PYTH a rectangle. We are looking for a solution that is nonrectangular.

Hint 2:



This is a drawing of option C. The lengths of TH and YP are not equal. This is not a parallelogram.

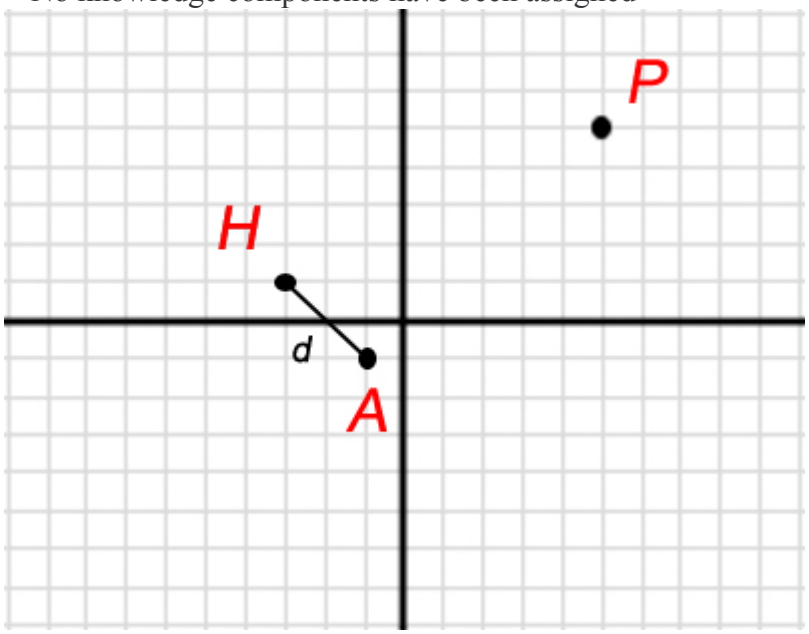
Hint 3:



This is a drawing of option B. This is the correct answer.

16.) "Looking for Pythagoras Investigation 1 #2" (Problem ID: 13975) RADIO_BUTTON

No knowledge components have been assigned

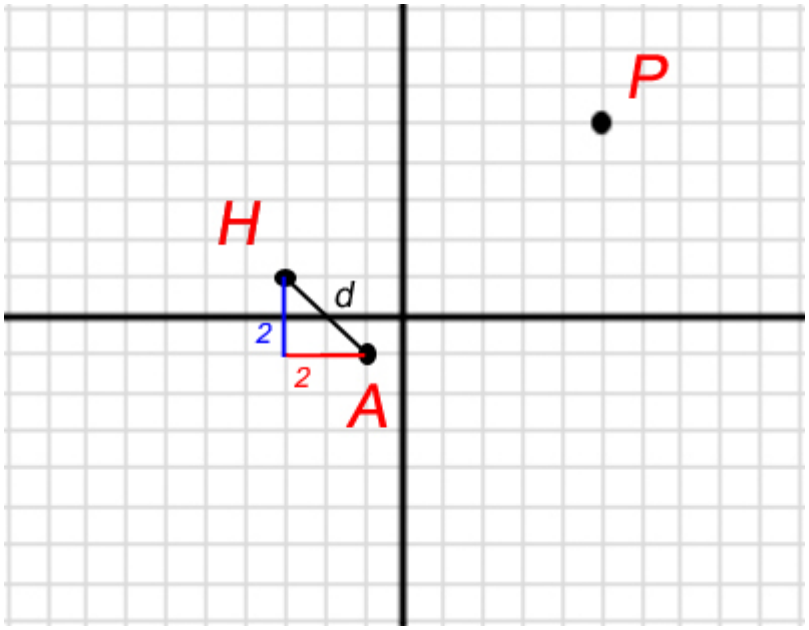


If you draw a line from H to A, as shown above, which statement is true about the distance **d**? Assume a unit is the length of the side of a square on the grid.

Answers: (Interface Type: RADIO_BUTTON)

✗ A. d = 2 units
✓ **B. d > 2 units**
✗ C. d < 2 units

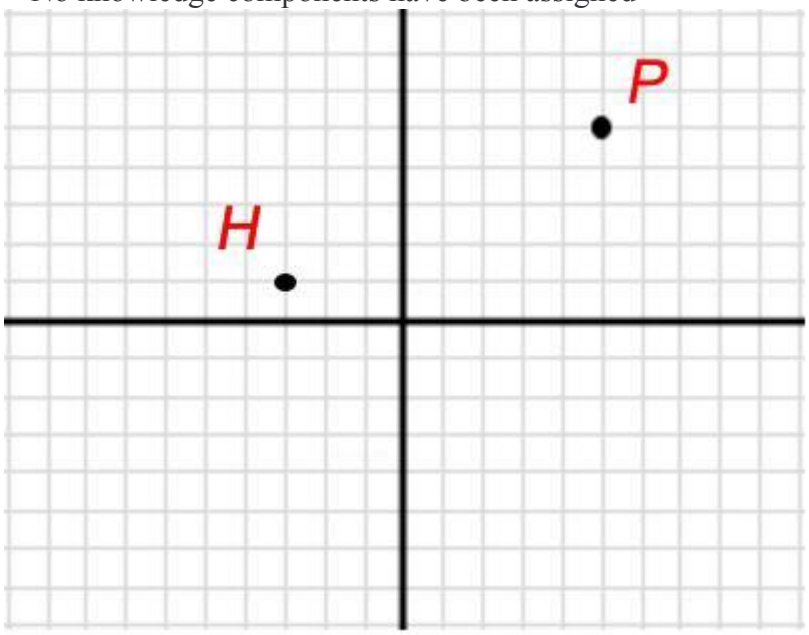
Hint 1:



Consider the triangle created by the line segment HA. The legs of the triangle are of length 2.
Hint 2:
If the legs of the triangle are of length 2, then the hypotenuse of the triangle cannot be smaller than the leg. d > 2 units. Choose answer choice **B**.

17.) "Looking for Pythagoras Investigation 1 #1" (Problem ID: 13974) RADIO_BUTTON

No knowledge components have been assigned

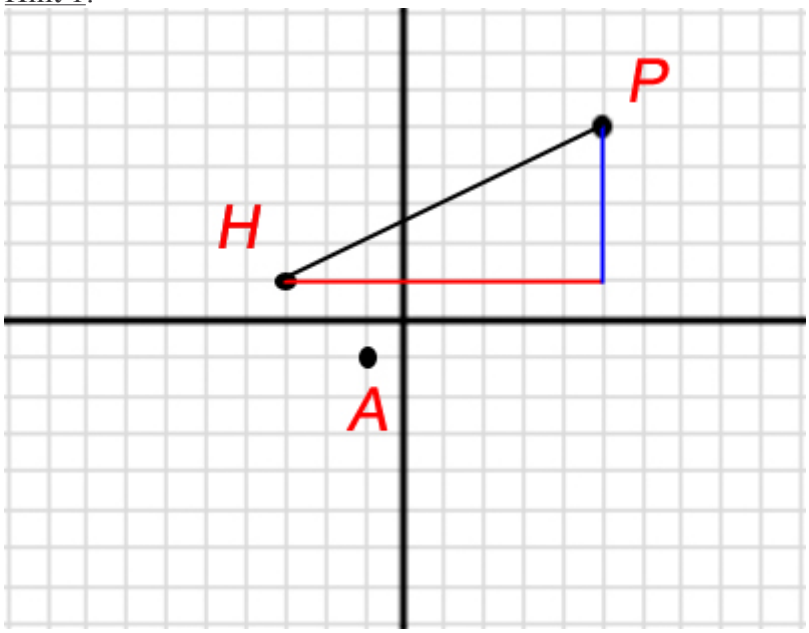


What is the point half way from H to P if you "fly by helicopter"? In other words, if you drew a straight line from H to P, what would be the midpoint?

Answers: (Interface Type: RADIO_BUTTON)

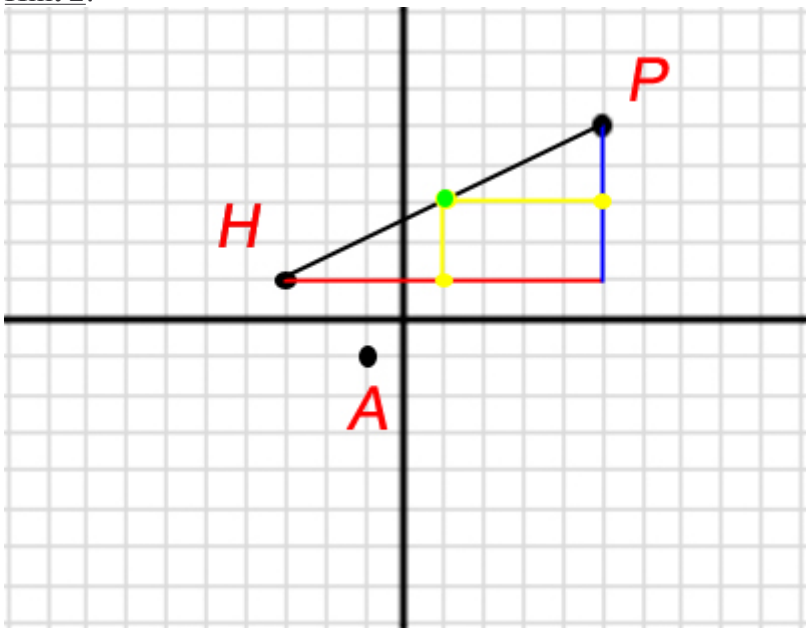
✓ **(1, 3)**
✗ (-4, 2)
✗ (3, 1)
✗ (4, 2)

Hint 1:



Start by drawing the legs of the triangle formed by the line from H to P. The midpoint of HP is at the middle of both the red and blue legs. Find the midpoints of the red and blue leg by counting.

Hint 2:



Once you have the triangle drawn, and the midpoints of the two legs found, you can find the midpoint as shown in the image above. Now you need to find the coordinate of the midpoint.

Hint 3:

The coordinates of the midpoint in green is (1, 3). Choose the (1, 3) answer choice.

18.) "CMP-ver2-10" (Problem ID: 13829) TEXT_FIELD

No knowledge components have been assigned

The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles (The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11
?	1273

How long will it take her to go 1273 miles?
Answers: (Interface Type: TEXT_FIELD)
✔ **635**

Hint 1:
Use the equation you found before: d=2h+3 In this question you are given d=1273. You can plug in the value of d and solve for h.
Hint 2:
1273 = 2h + 3
Hint 3:
1270 = 2h
Hint 4:
h = 1270/2
Hint 5:
The correct answer is '635'. Please enter/select '635' (without quotes).

19.) "CMP-ver2-9" (Problem ID: 13828) TEXT_FIELD

No knowledge components have been assigned
The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11
150	?

How much distance will she have covered after 150 hours?
Answers: (Interface Type: TEXT_FIELD)
✔ **303**

Hint 1:
Use the equation you found before: 2h+3
Hint 2:
2 * 150 + 3 = ?
Hint 3:
300 + 3 = ?
Hint 4:
The correct answer is '303'. Please enter/select '303' (without quotes).

20.) "CMP-ver2-8" (Problem ID: 13827) ALGEBRA_FIELD

No knowledge components have been assigned

The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles (The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11
h	?

How much distance will she have covered after h hours?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **2h + 3**

Hint 1:
When h is equal to 0, she has travelled 3 miles.
Hint 2:
For each hour she travels an additional 2 miles.
Hint 3:
The correct answer is '2h + 3'. Please enter/select '2h + 3' (without quotes).

21.) "CMP-ver2-7" (Problem ID: 13826) ALGEBRA_FIELD

No knowledge components have been assigned

The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3

1	5
2	7
3	9
4	11
?	150

For how many hours has she been biking if she has travelled 150 miles?

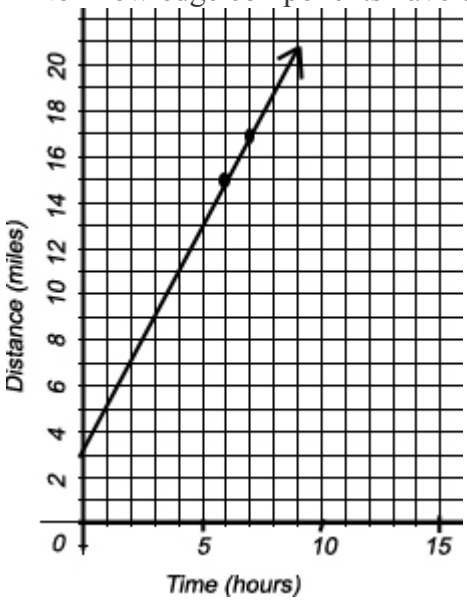
Answers: (Interface Type: ALGEBRA_FIELD)

✔ **6**

Hint 1:
First find the point on the line that shows that she has travelled 150 miles.
Hint 2:
Now that you have found the point, how many hours does that point represent?
Hint 3:
The correct answer is '6'. Please enter/select '6' (without quotes).

22.) "CMP-ver2-6" (Problem ID: 13825) ALGEBRA_FIELD

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles (The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9

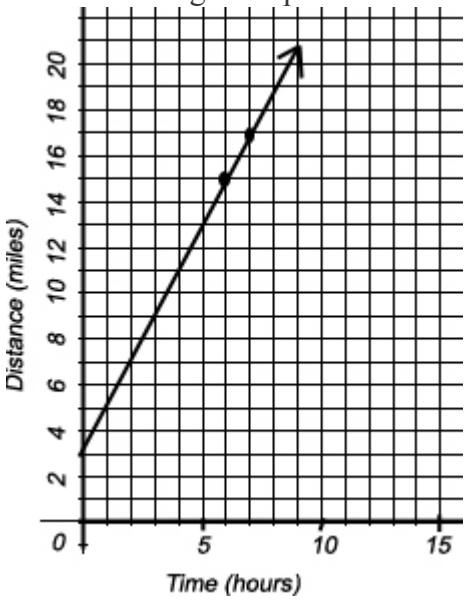
4	11
?	15

For how many hours has she been biking if she has travelled 15 miles?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **6**

Hint 1:
First find the point on the line that shows that she has travelled 15 miles.
Hint 2:
Now that you have found the point, how many hours does that point represent?
Hint 3:
The correct answer is '6'. Please enter/select '6' (without quotes).

23.) "CMP-ver2-5" (Problem ID: 13821) ALGEBRA_FIELD

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11
7	?

How much distance will she have covered after 7 hours?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **17**

Hint 1:
First find the point on the line that shows where she is after 7 hours.
Hint 2:
The correct answer is '17'. Please enter/select '17' (without quotes).

24.) "CMP-ver2-4" (Problem ID: 13820) ALGEBRA_FIELD

No knowledge components have been assigned

The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

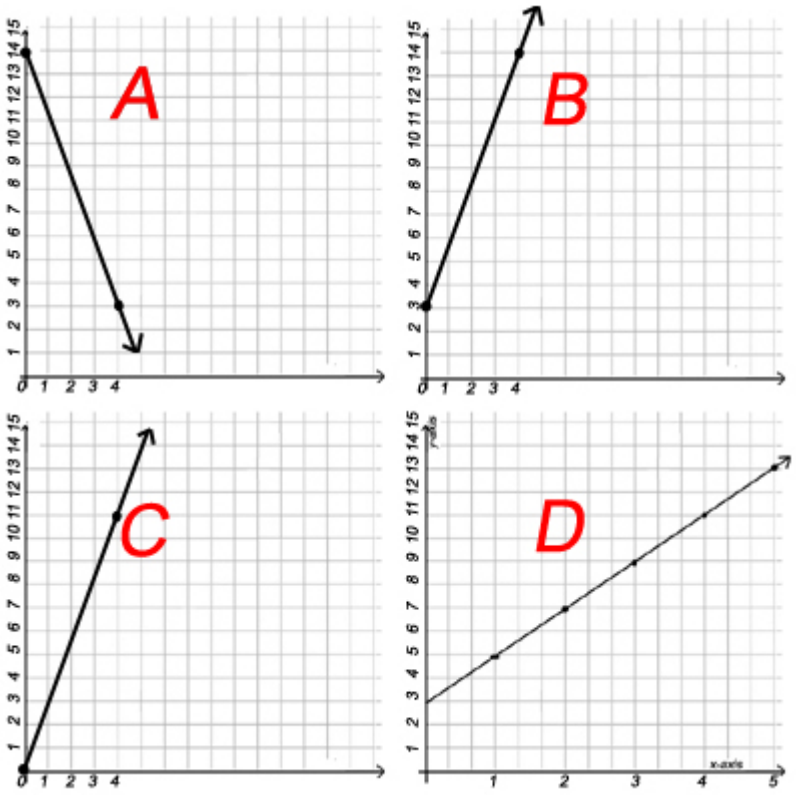
Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11
100	?

How much distance will she have covered after 100 hours?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **203**

Hint 1:
You need to figure out what operation you can do to the hours to get the distance traveled.
Hint 2:
You need to multiply the hours times the speed plus the starting distance to get the total distance.
Hint 3:
The answer is 2*100+3 = 203. Please enter 203

25.) "CMP-ver2-3" (Problem ID: 13819) ALGEBRA_FIELD

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles (The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11

Which of the above graphs represents the data given in the table?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **D**

Hint 1:
First plot the point representing the distance she has travelled after 0 hours. Then plot the other points.

Hint 2:
The correct answer is 'D'. Please enter/select 'D' (without quotes).

26.) "CMP-ver2-2" (Problem ID: 13813) ALGEBRA_FIELD

No knowledge components have been assigned

The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she

had already completed 3 miles The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11
5	
6	?

How much distance will she have covered after 6 hours?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **15**

Hint 1:
How much did her distance change per hour?
Hint 2:
If she has reached 11 miles after 4 hours, and she rides two more miles for each hour. She will have ridden 4 more miles after two hours.
Hint 3:
The answer is 15 miles per hour. Please enter 15

27.) "CMP-ver2-1" (Problem ID: 13812) ALGEBRA_FIELD

No knowledge components have been assigned
The table below shows the distance Jennifer traveled during the 4 hours of her bike trip after she had already completed 3 miles The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	3
1	5
2	7
3	9
4	11

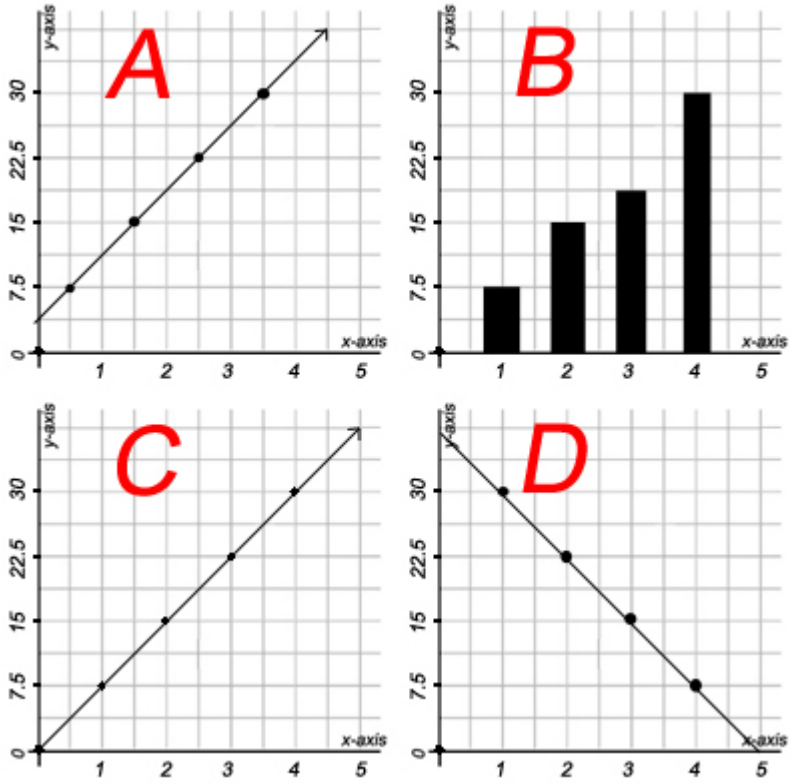
How fast did Jennifer travel in miles per hour?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **2**

Hint 1:
How much did her distance change per hour?
Hint 2:

The answer is 2 miles per hour. Please enter 2

28.) "CMP-version2" (Problem ID: 13729) RADIO_BUTTON [MA - 2003 - Spring - 20]

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the first 4 hours of her bike trip (The table shows the distance covered while the she was actually riding (the time is not counted when they stop to rest, eat, etc.)

Number of hours riding	Distance Covered
0	0
1	7.5
2	15
3	22.5
4	30
5	
6	?

Which of the above graphs represents the data given in the table?

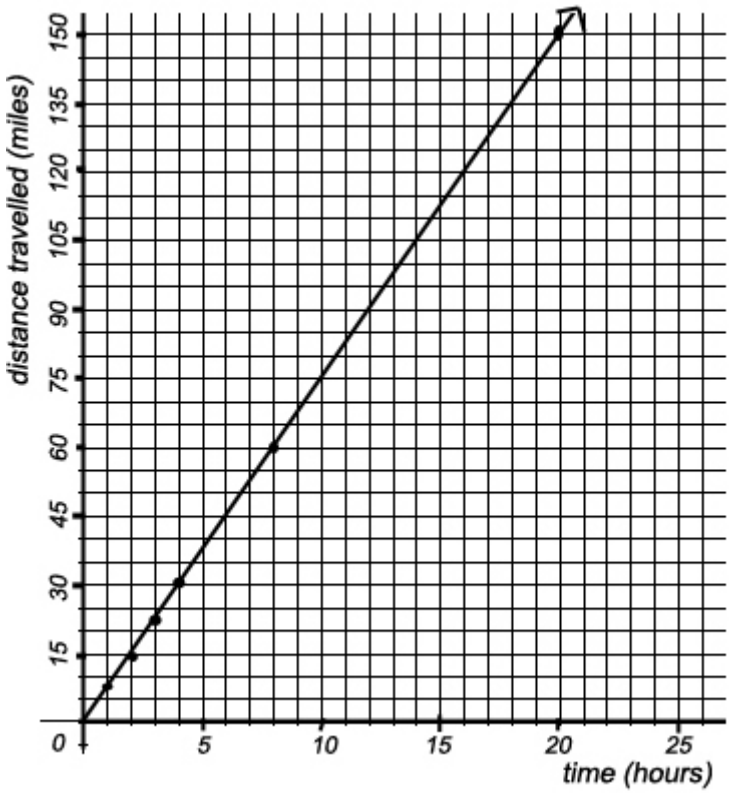
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:
Begin by plotting the points given in the data table.
Hint 2:
The correct answer is 'C'. Please enter/select 'C' (without quotes).

29.) "CMP-1stEd-MSA-graph-3.5b" (Problem ID: 13484) TEXT_FIELD

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the first 4 hours of her bike trip (The table shows the distance covered while she was actually riding (the time is not counted when she stops to rest, eat, etc.)

Number of hours riding	Distance Covered
0	0
1	7.5
2	15
3	22.5
4	30

For how many hours has she been biking if she has travelled 150 miles?

Answers: (Interface Type: TEXT_FIELD)

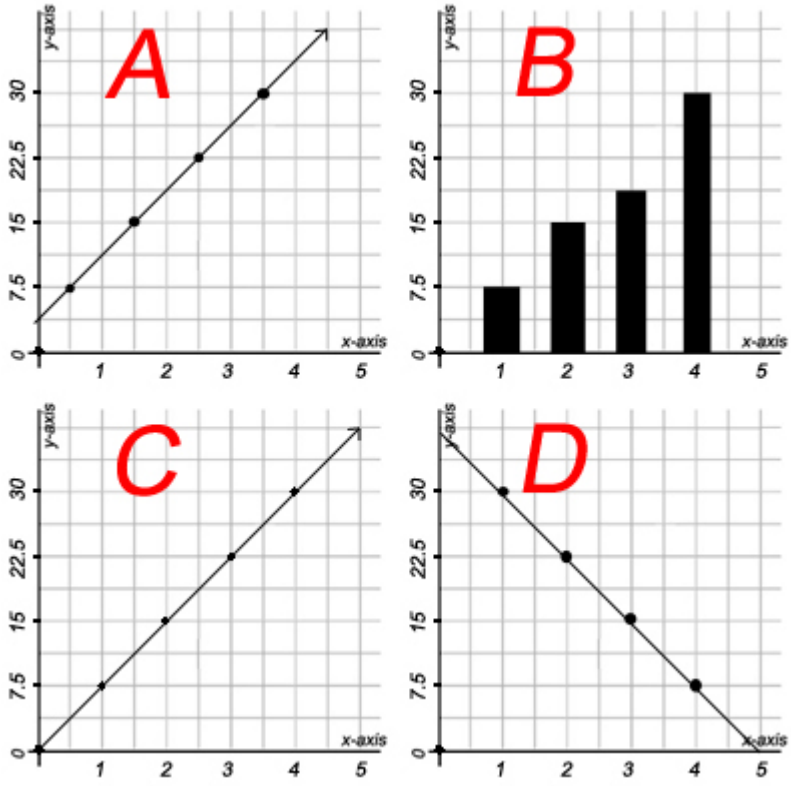
✔ **20**

Hint 1:
First find the point on the line that shows that she has travelled 150 miles.

Hint 2:
Now that you have found the point, how many hours does that point represent?
Hint 3:
The correct answer is '225'. Please enter/select '225' (without quotes).

30.) "CMP-1stEd-MSA-graph-2.5" (Problem ID: 13483) RADIO_BUTTON

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the first 4 hours of her bike trip (The table shows the distance covered while she was actually riding (the time is not counted when they stop to rest, eat, etc.)

Number of hours riding	Distance Covered
0	0
1	7.5
2	15
3	22.5
4	30

Which of the above graphs represents the data given in the table?

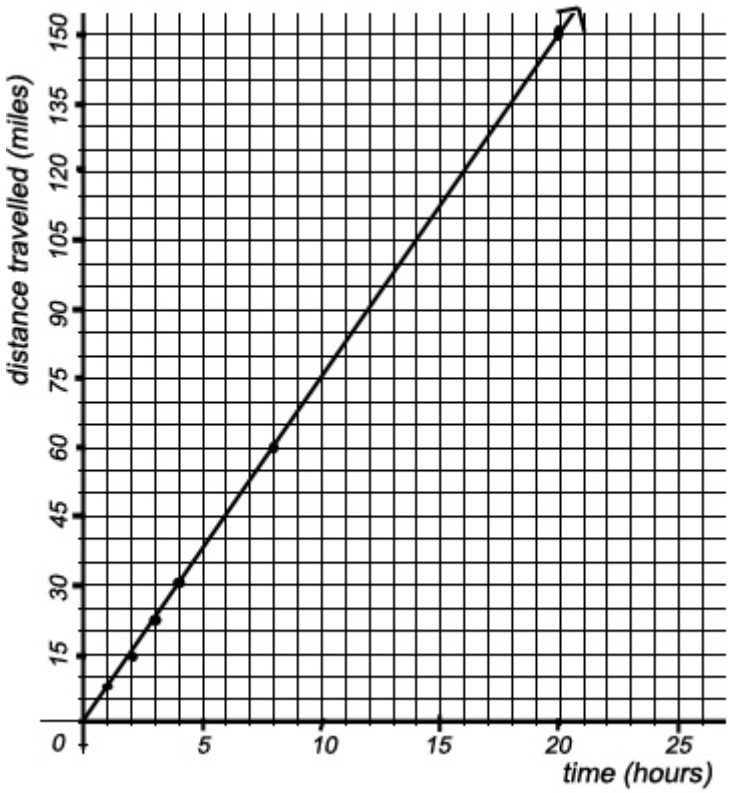
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:
Begin by plotting the points given in the data table.
Hint 2:
The correct answer is 'C'. Please enter/select 'C' (without quotes).

31.) "CMP-1stEd-MSA-graph-3.5a" (Problem ID: 13469) TEXT_FIELD

No knowledge components have been assigned



The table below shows the distance Jennifer traveled during the first 4 hours of her bike trip (The table shows the distance covered while she was actually riding (the time is not counted when they stop to rest, eat, etc.)

Number of hours riding	Distance Covered
0	0
1	7.5
2	15
3	22.5
4	30

How many miles has she travelled if she has been riding for a total of 8 hours?

Answers: (Interface Type: TEXT_FIELD)

✔ **60**

Hint 1:
First find the point on the line that shows where she is after 8 hours.

Hint 2:
The correct answer is '60'. Please enter/select '60' (without quotes).

32.) "Moving Straight Ahead Investigation 3 #6" (Problem ID: 13116) TEXT_FIELD

No knowledge components have been assigned

Ming is saving money to buy a bike. Her grandparents gave her some money to start her savings. She will also be saving half her allowance each week. This equation shows the savings **S** she has after **w** weeks:
S = 30 + 5w

After how many weeks will Ming be able to buy a bike that costs $125?
Answers: (Interface Type: TEXT_FIELD)
✔ **19**

Hint 1:
Ming needs $125 to buy the bike. So the value of S in the equation is given to be 125:

125 = 30 + 5w

Solve for w.
Hint 2:
To simplify the equation, you need to separate the variable expressions from the constants using the properties of equality.
Hint 3:
Subtracting both sides by 30 gives you:
125 - 30 = 30 - 30 + 5w
125 - 30 = 5w
Hint 4:
Simplifying the equation 125 - 30 = 5w by combining like terms gives you:
95 = 5w
Hint 5:
Dividing both sides by 5 gives you w = 19. Ming will be able to buy a bike costing 125 after 19 weeks.
Type in 19.

33.) "Moving Straight Ahead Investigation 3 #5" (Problem ID: 13111) TEXT_FIELD

No knowledge components have been assigned

Company A

# of Snacks	Cost
0	15.00
1	15.25
2	15.50
3	15.75
4	16.00

Company B

# of Snacks	Cost
0	0
1	0.50
2	1.00
3	1.50
4	2.00

Booker T. Washington Middle School found two companies that would deliver healthy snacks to their school. The tables above show the cost for each company.

The equations for Cost (**C**) for **s** snacks are:
C = 0.25s + 15 for Company A
C = 0.5s for Company B

What is the number of snacks the school must buy for the cost to be equal for the two companies?
Answers: (Interface Type: TEXT_FIELD)
✔ **60**

Hint 1:
Given the two equations, you must set the Cost equal to each other. This gives you 0.25s + 15 = 0.5s
Hint 2:
0.5s - 0.25s = 15
Hint 3:
0.25s = 15
Hint 4:
The correct answer is '60'. Please enter/select '60' (without quotes).

34.) "Moving Straight Ahead Investigation 3 #4" (Problem ID: 13109) RADIO_BUTTON

No knowledge components have been assigned

Company A

# of Snacks	Cost
0	15.00
1	15.25
2	15.50
3	15.75
4	16.00

Company B

# of Snacks	Cost
0	0
1	0.50
2	1.00
3	1.50
4	2.00

Booker T. Washington Middle School found two companies that would deliver healthy snacks to their school. The tables above show the cost for each company.

What is the equation for Cost (**C**) if the school buys **s** snacks from Company A?
Answers: (Interface Type: RADIO_BUTTON)
✗ C = 0.25 + 15
✓ **C = 0.25s + 15**
✗ C = 15.25s+ 15
✗ C = 15s+ 15.25.

Hint 1:
The initial cost is $15. And it is increased by $0.25 for each snack they buy.
Hint 2:
The cost of snacks for **s** students would be 0.25s.
Hint 3:
The total cost is the 15 dollars plus the 0.25s or in algebra it would be C = 15 + 0.25s. Select C = 15 + 0.25s

---

35.) "Moving Straight Ahead Investigation 3 #3" (Problem ID: 13108) TEXT_FIELD

No knowledge components have been assigned
Use the properties of equality to solve the equation for **x**.

4(6 + x) = 2x

What is the value of x?
Answers: (Interface Type: TEXT_FIELD)
✓ **-12**

Hint 1:
Start by distributing the 4 into the expression in parenthesis.

Hint 2:
Distributing the 4 into the expression in parenthesis gives you:
4 * 6 + 4 * x = 2x
24 + 4x = 2x
Hint 3:
Subtracting both sides by 24 gives you this:
24 - 24 + 4x = 2x - 24
4x = 2x - 24
Hint 4:
Next, you can subtract both sides by 2x:
4x - 2x = 2x - 2x - 24
4x - 2x = -24
Simplify 4x - 2x = -24 by combining like terms.
Hint 5:
Combining like terms gives you:
2x = -24
Hint 6:
Dividing both sides by 2 gives you:
x = -12
Type in -12

36.) "Moving Straight Ahead Investigation 3 #2" (Problem ID: 13107) TEXT_FIELD

No knowledge components have been assigned

Use the properties of equality to solve the equation for **x**.

4 + 2x = 10x - 12

What is the value of x?

Answers: (Interface Type: TEXT_FIELD)

✔ **2**

Hint 1:
Start by using the properties of equality to get the variable terms on one side and the constants on the other.
Hint 2:
Adding both sides by 12 gives you:
12 + 4 + 2x = 10x - 12 + 12
12 + 4 + 2x = 10x
Hint 3:
Subtracting both sides by 2x gives you:
12 + 4 + 2x - 2x = 10x - 2x
12 + 4 = 10x - 2x
16 = 8x
Hint 4:
Dividing both sides by 8 gives you the equation x = 2. Type in 2.

37.) "Moving Straight Ahead Investigation 3 #1" (Problem ID: 13106) TEXT_FIELD

No knowledge components have been assigned

Use the properties of equality to solve the equation for **x**.

2x - 40 = 60

What is the value of x?
Answers: (Interface Type: TEXT_FIELD)
✓ **50**

Hint 1:
Start by separating the variable expressions from the constants by adding 40 to both sides.
Hint 2:
Adding 40 to both sides gives you:
2x - 40 + 40 = 60 + 40
2x = 60 + 40
2x = 100
Dividing both sides by 2 will give you the value of x.
Hint 3:
2x/2 = 100/2
x = 100 /2
x = 50
The value of x is 50! Type in 50.

38.) "Moving Straight Ahead Investigation 2 #9" (Problem ID: 13103) TEXT_FIELD

No knowledge components have been assigned
Ming is saving money to buy a bike. Her grandparents gave her some money to start her savings. She will also be saving half her allowance each week. This equation shows the savings **S** she has after **w** weeks:
S = 30 + 5w

What is the coefficient of the **w** in the equation?
Answers: (Interface Type: TEXT_FIELD)
✓ **5**

Hint 1:
The coefficient is the value that w is multiplied by.
Hint 2:
The correct answer is '5'. Please enter/select '5' (without quotes).

39.) "Moving Straight Ahead Investigation 2 #8" (Problem ID: 13101) TEXT_FIELD [MA - 2004 - Spring - 1]

No knowledge components have been assigned
Ming is saving money to buy a bike. Her grandparents gave her some money to start her savings. She will also be saving half her allowance each week. This equation shows the savings **S** she has after **w** weeks:
S = 5w + 30

If we plot this equation on a graph where her savings is represented by the y-axis, what is the y-intercept of this equation?
Answers: (Interface Type: TEXT_FIELD)
✓ **30**

Hint 1:

The equation is in y=mx+b form. b represents the y-intercept.
Hint 2:
The equation is S = 5w + 30. That means that the y-intercept is 30. Type in 30.

40.) "Moving Straight Ahead Investigation 2 #7" (Problem ID: 13100) TEXT_FIELD [MA - 2004 - Spring - 1]

No knowledge components have been assigned

Ming is saving money to buy a bike. Her grandparents gave her some money to start her savings. She will also be saving half her allowance each week. This equation shows the **S** dollars she has after **w** weeks:
S = 30 + 5w

How many **dollars did her grandparents give her**?
Answers: (Interface Type: TEXT_FIELD)
✔ **30**

Hint 1:
The amount her grandparents gave her is what she has after 0 weeks.
Hint 2:
At 0 weeks, she has S = 30 + 5 * 0 = 30 + 0 = 30 dollars. This means that her grandparents gave her 30 dollars to start with.
Hint 3:
You could also have found the answer by looking at the constant term in the equation written in y=mx+**b** form. The correct answer is 30. Type in 30.

41.) "Moving Straight Ahead Investigation 2 #6" (Problem ID: 13099) ALGEBRA_FIELD [MA - 2004 - Spring - 1]

No knowledge components have been assigned

Ming is saving money to buy a bike. Her grandparents gave her some money to start her savings. She will also be saving half her allowance each week. This equation shows the **S** dollars she has after **w** weeks:
S = 30 + 5w

How many **dollars is she saving each week**?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **5**

Hint 1:
To find how much she is saving each week, find the difference between how much she has saved after 0 weeks and after 1 week.
Hint 2:
After 0 weeks, she has saved S&sub0; = 30 + 5 * 0 = 30 + 0 = 30
After 1 week, she has saved S&sub1; = 30 + 5 * 1 = 30 + 5 = 35
Here is a table showing what we now know.

Week	Savings
0	30
1	35

Hint 3:
The difference between her savings after 0 and 1 weeks is 35 - 30 = 5. Notice that 5 is the coefficient of **w**, and can be read from the equation as long as it is in the form y=mx+b.

Type in 5.

42.) "Moving Straight Ahead Investigation 2 #5" (Problem ID: 13096) ALGEBRA_FIELD

No knowledge components have been assigned

Company A

# of Snacks	Cost
0	15.00
1	15.25
2	15.50
3	15.75
4	16.00

Company B

# of Snacks	Cost
0	0
1	0.50
2	1.00
3	1.50
4	2.00

Booker T. Washington Middle School found two companies that would deliver healthy snacks to their school. The tables above show the cost for each company.

How many dollars does **Company B** charge per snack?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **0.50**

Hint 1:

To find how many dollars company B charges for each snack, find the difference between the cost of 1 snack and the cost of 2 snacks.

Hint 2:

Company A

# of Snacks	Cost
0	15.00
1	15.25
2	15.50
3	15.75
4	16.00

+0.25
+0.25

Company B

# of Snacks	Cost
0	0
1	0.50
2	1.00
3	1.50
4	2.00

+0.50
+0.50

Take a look at this image.
Hint 3:
Company B charges 0.50 per snack. Type in 0.50

43.) "Moving Straight Ahead Investigation 2 #4" (Problem ID: 13095) ALGEBRA_FIELD

No knowledge components have been assigned

Company A

# of Snacks	Cost
0	15.00
1	15.25
2	15.50
3	15.75
4	16.00

Company B

# of Snacks	Cost
0	0
1	0.50
2	1.00
3	1.50
4	2.00

Booker T. Washington Middle School found two companies that would deliver healthy snacks to

their school. The tables above show the cost for each company.

How many dollars does **Company A** charge per snack?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **0.25**

Hint 1:
To find how many dollars company A charges for each snack, find the difference between the cost of 1 snack and the cost of 2 snacks.
Hint 2:

Company A

# of Snacks	Cost	
0	15.00	
1	15.25	+0.25
2	15.50	+0.25
3	15.75	
4	16.00	

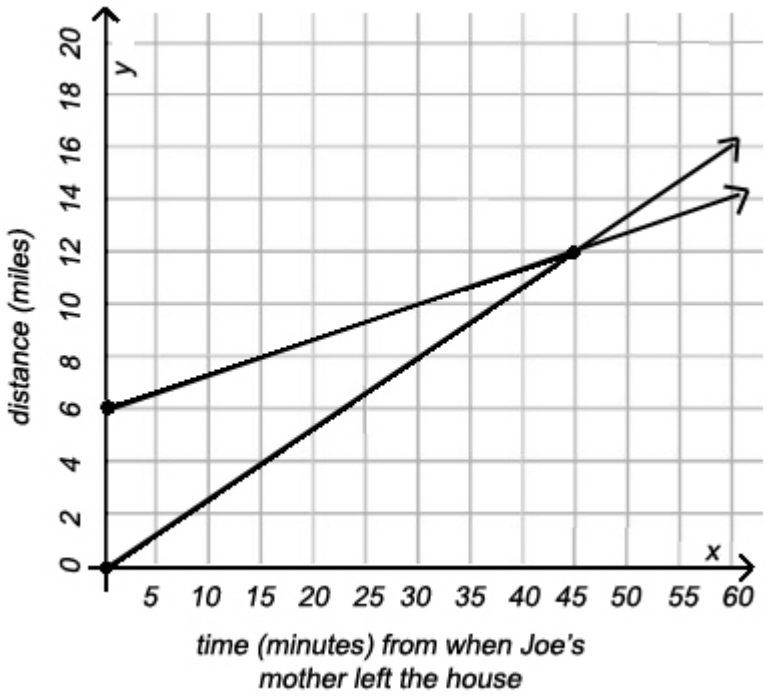
Company B

# of Snacks	Cost	
0	0	
1	0.50	+0.50
2	1.00	+0.50
3	1.50	
4	2.00	

Take a look at this image.
Hint 3:
Company A charge 0.25 per snack. Type in 0.25

44.) "Moving Straight Ahead Investigation 2 #3" (Problem ID: 13092) TEXT_FIELD

No knowledge components have been assigned



Joe went for a bike ride but he forgot his lunch. He was 6 miles away when his mother noticed. His mother got on her bike and rode after him. The graph shows the distance Joe and his mother have traveled starting from the time she left the house.

If Joe's mother keeps riding at the same speed, how far will she have gone **after a total of 1 hour** from when she left home?

Answers: (Interface Type: TEXT_FIELD)

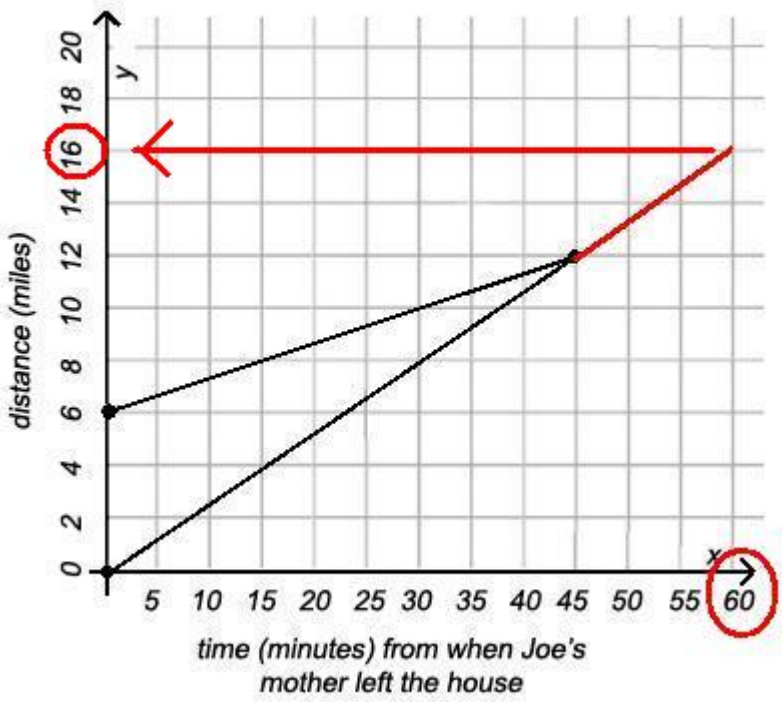
✓ **16**

✗ 14 *No- that is how far if you extended Joe's line but this question as you about his mother.*

Hint 1:
Remember, one hour is 60 minutes.
Hint 2:
If we follow Joe's mother's line, where will it be after one hour?
Hint 3:

Take a look at this line extended.
Hint 4:

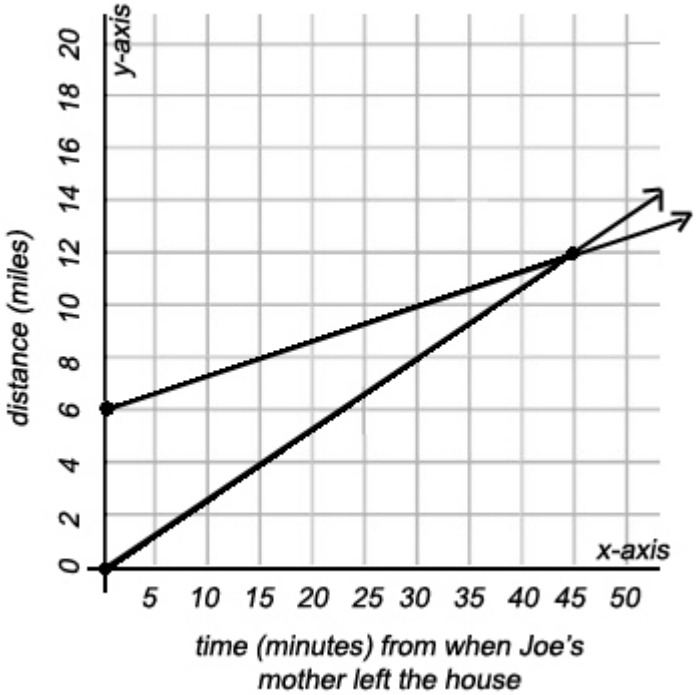
Find the point where his mother has biked for 1 hour or 60 minutes.
Hint 5:



The answer is 16.

45.) "Moving Straight Ahead Investigation 2 #2" (Problem ID: 13091) TEXT_FIELD

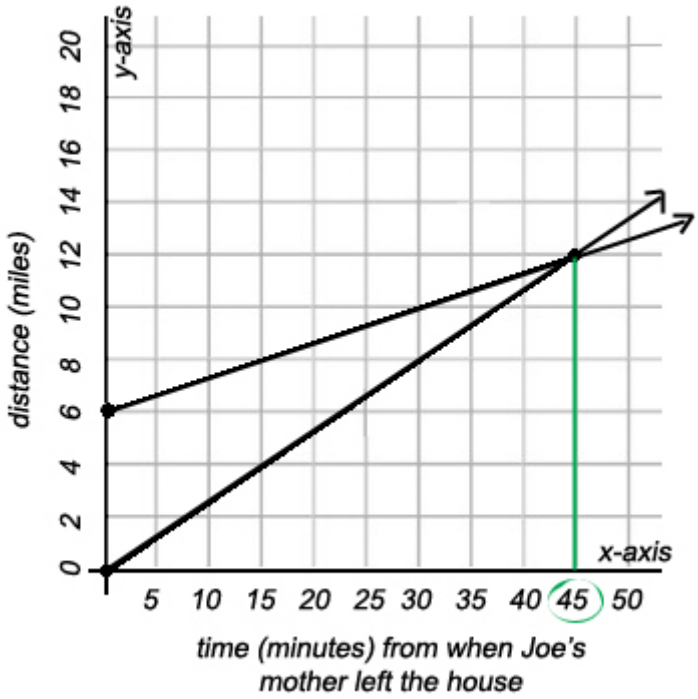
No knowledge components have been assigned



Joe went for a bike ride but he forgot his lunch. He was 6 miles away when his mother noticed. His mother got on her bike and rode after him. The graph shows the distance Joe and his mother have traveled starting from the time she left the house.

After how many **minutes** does Joe's mother catch up to him?
Answers: (Interface Type: TEXT_FIELD)
✔ **45**

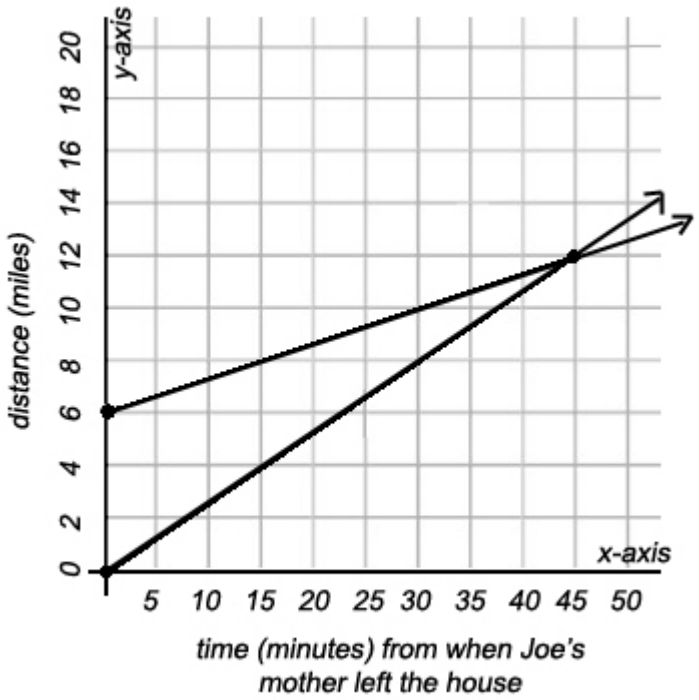
Hint 1:
Joe's mother catches up to him when the two lines (representing their distance and time) intersect.
Hint 2:



The time at the point the two lines intersect is given by the x-coordinate value.
Hint 3:
Joe's mother catches up to him after 45 minutes. Type in 45.

46.) "Moving Straight Ahead Investigation 2 #1" (Problem ID: 13090) ALGEBRA_FIELD

No knowledge components have been assigned



Joe went for a bike ride but he forgot his lunch. He was 6 miles away when his mother noticed. His mother got on her bike and rode after him. The graph shows the distance Joe and his mother have traveled starting from the time she left the house.

How many **miles** from home does Joe's mother catch up to him?

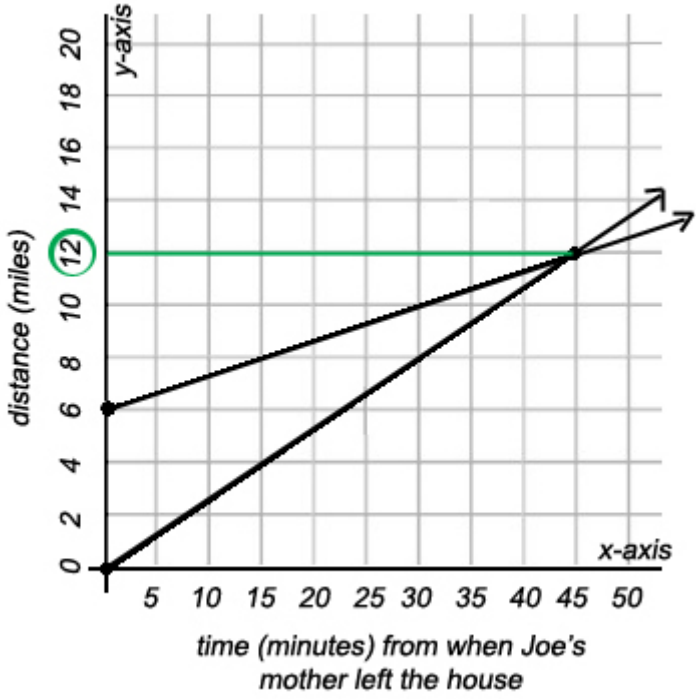
Answers: (Interface Type: ALGEBRA_FIELD)

✔ **12**

Hint 1:

Joe's mother catches up to him when the two lines (representing their distance and time) intersect.

Hint 2:



The distance at the point the two lines intersect is given by the y-coordinate value.
Hint 3:
Joe's mother catches up to him after 12 miles. Type in 12.

47.) "Moving Straight Ahead Investigation 1 #6" (Problem ID: 13089) RADIO_BUTTON

No knowledge components have been assigned

A

X	-4	-2	0	2	4	6
Y	20	18	16	14	12	10

B

X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15

C

X	0	3	6	9	12	15
Y	5	5	5	5	5	5

Which table shows a rate of change of zero?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✓ **C**

Hint 1:
A rate of change of zero means that regardless of what X is, Y remains the same.
Hint 2:

B

		+1	+1	+1	+1	+1
X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15
		+2	+2	+2	+2	+2

Notice that for table B, as X gets larger, Y gets larger. Table B has a **positive** rate of change.
Now check tables A and C.
Hint 3:

C

		+2	+2	+2	+2	+2
X	0	3	6	9	12	15
Y	5	5	5	5	5	5
		0	0	0	0	0

You can see from the image above, table C has a **rate of change of zero**. Choose answer choice C.

48.) "Moving Straight Ahead Investigation 1 #5" (Problem ID: 13088) RADIO_BUTTON

No knowledge components have been assigned

A

X	-4	-2	0	2	4	6
Y	20	18	16	14	12	10

B

X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15

C

X	0	3	6	9	12	15
Y	5	5	5	5	5	5

Which table shows a **negative** rate of change?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A**

✗ B

✗ C

Hint 1:

A negative rate of change means that as X increases, Y decreases.

Hint 2:

B

		+1	+1	+1	+1	+1
X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15
		+2	+2	+2	+2	+2

Notice that for table B, as X gets larger, Y gets larger. Table B has a **positive** rate of change.

Now check tables A and C.
Hint 3:

A

		+2	+2	+2	+2	+2
X	-4	-2	0	2	4	6
Y	20	18	16	14	12	10
		-2	-2	-2	-2	-2

B

		+1	+1	+1	+1	+1
X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15
		+2	+2	+2	+2	+2

As you can see from the image above, table A has a **negative rate** of change. Choose answer choice A.

49.) "Moving Straight Ahead Investigation 1 #4" (Problem ID: 13087) RADIO_BUTTON [MA - 2002 - Spring - 37]

No knowledge components have been assigned

A

X	-4	-2	0	2	4	6
Y	20	18	16	14	12	10

B

X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15

C

X	0	3	6	9	12	15
Y	5	5	5	5	5	5

Which table shows a **positive** rate of change?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✓ **B**
✗ C

Hint 1:
A positive rate of change means that as X increases, Y increases.

Hint 2:

A

		+2	+2	+2	+2	+2
X	-4	-2	0	2	4	6
Y	20	18	16	14	12	10
		-2	-2	-2	-2	-2

Notice that for table A, as X gets larger, Y gets smaller. Table A has a **negative** rate of change. Now Check B and C.

Hint 3:

B

		+1	+1	+1	+1	+1
X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15
		+2	+2	+2	+2	+2

C

		+2	+2	+2	+2	+2
X	0	3	6	9	12	15
Y	5	5	5	5	5	5
		0	0	0	0	0

As you can see from the image above, table B has a **positive rate** of change. Choose answer choice B.

50.) "Moving Straight Ahead Investigation 1 #3" (Problem ID: 13086) RADIO_BUTTON [MA - 2002 - Spring - 37]

No knowledge components have been assigned

Booker T. Washington Middle School is going to have healthy snacks delivered to the school. They are charged $15 for the delivery and then $0.35 for each snack.

Which equation calculates the cost **C** for **n** students?

Answers: (Interface Type: RADIO_BUTTON)

✗ C = .35 - 15n
✓ **C = 15 + .35n**
✗ C = 15n + .35
✗ C = .35n - 15

Hint 1:

Since n is the number of students, the total cost of snacks without delivery is 0.35 * n.

Hint 2:

To calculate the total cost C, add the delivery cost to the cost of the snacks for the n students mentioned above.

Hint 3:

C = 15 + .35n
Select C = 15 + .35n

51.) "Moving Straight Ahead Investigation 1 #2" (Problem ID: 13085) RADIO_BUTTON [MA - 2002 - Spring - 37]

No knowledge components have been assigned

X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15

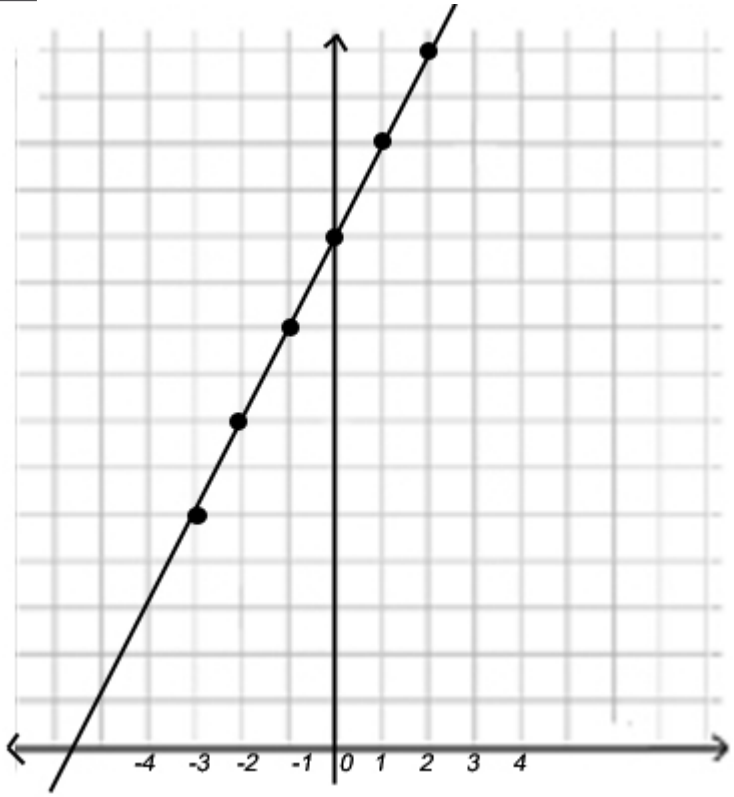
Which equation would produce the table of values shown above?

Answers: (Interface Type: RADIO_BUTTON)

✓ **y = 2x + 11**
✗ y = 4x + 7
✗ y = -2x + 9
✗ y = -2x + 5

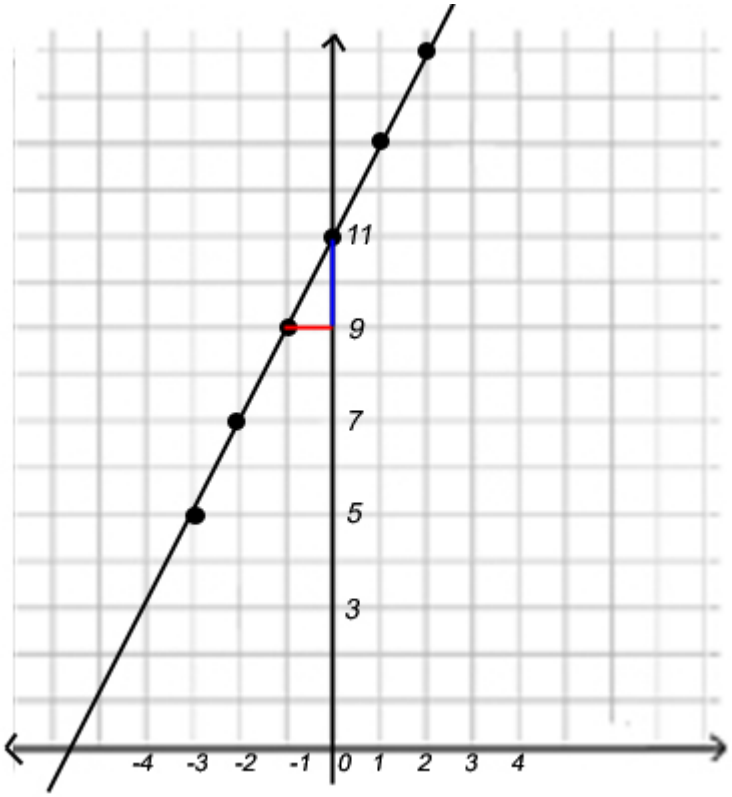
Hint 1:
Start by drawing a picture. Plot each of the points whose x and y coordinates are shown in the table and connect them with a line.
To find the equation, you need to find the slope and the y-intercept. Then you can place them into the y=mx+b form.

Hint 2:



The image above shows the line represented by the data table. To find the slope, count the rise and the run between two points on the line. The slope is equal to the rise divided by the run.

Hint 3:



The image above shows the rise and run between two possible points. The slope is equal to the rise divided by the run, which is 4 / 1.

Hint 4:

Now that we have the slope, we need to find the y-intercept. The y-intercept is where the line intersects the y-axis. That means that the x-coordinate will be equal to 0 at that point.

Hint 5:

Looking at the data table, we see that when x is equal to 0, the y coordinate is equal to 11. That means that the y-intercept is 11. Plug in the slope and y-intercept into the y=mx+b form to get the answer.

Hint 6:

Plugging in the slope and y-intercept gives you the answer:

y=2x+11

Choose the answer choice y=2x+11.

52.) "Moving Straight Ahead Investigation 1 #1" (Problem ID: 13084) RADIO_BUTTON [MA - 2002 - Spring - 37]

No knowledge components have been assigned

A

X	-4	-2	0	2	4	6
Y	20	18	16	14	12	10

B

X	0	1	2	3	4	5
Y	3	5	8	12	17	23

C

X	-3	-2	-1	0	1	2
Y	5	7	9	11	13	15

D

X	0	3	6	9	12	15
Y	5	5	5	5	5	5

Which table does **not** show a linear relationship?

Answers: (Interface Type: RADIO_BUTTON)

✗ A
✓ **B**
✗ C
✗ D

Hint 1:
A linear relationship means that the slope is constant.
Hint 2:
To find the slope, take two x-y pairs (x1, y1) and (x2, y2) and find (y2-y1)/(x2-x1).
Hint 3:
Take a look at the slopes of table B.
Hint 4:
The correct answer is 'B'. Please enter/select 'B' (without quotes).

53.) "Thinking with Mathematical Models Investigation 3 #4" (Problem ID: 12846) RADIO_BUTTON

No knowledge components have been assigned

A

X	0	1	2	3	4	5
Y	3	6	16	19	21	35

B

X	0	5	10	20	30	40
Y	7	17	27	47	67	87

C

X	1	2	3	4	5	6
Y	16	8	6	5	3	1

D

X	2	4	6	8	10	12
Y	24	12	8	6	4.8	4

Which of the four tables above shows a **linear** relationship between the variables **x** and **y**?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✓ **B**
✗ C
✗ D

Hint 1:
A linear relationship means a constant rate of change.
Hint 2:

A

X	0	1	2	3	4	5
Y	3	6	16	19	21	35
		+3	+10	+3	+2	+14

Take a look at Table A. The image above shows that its rate of change is not constant. Therefore it is not a linear relationship. Take a look at Table B.
Hint 3:

B

		+5	+5	+10	+10	+10
X	0	5	10	20	30	40
Y	7	17	27	47	67	87
		+10	+10	+20	+20	+20

Rate of Change 10/5 10/5 20/10 20/10 20/10 = 2

The image above shows that Table B has a constant rate of change. The ratio between the change of y and x is always 2.
Hint 4:
Since Table B has a constant rate of change, it has a linear relationship. Choose answer choice B.

54.) "Thinking with Mathematical Models Investigation 3 #3" (Problem ID: 12845) RADIO_BUTTON

No knowledge components have been assigned

A

X	0	1	2	3	4	5
Y	3	6	16	19	21	35

B

X	0	5	10	20	30	40
Y	7	17	27	47	67	87

C

X	1	2	3	4	5	6
Y	16	8	6	5	3	1

D

X	2	4	6	8	10	12
Y	24	12	8	6	4.8	4

Which of the four tables above shows an **inversely proportional** relationship between the variables **x** and **y**?
Answers: (Interface Type: RADIO_BUTTON)
✗ A
✗ B
✗ C
✓ **D**

Hint 1:
An inversely proportional relationship means that the product of the x and y is a constant.

Hint 2:
Notice that the product of the x and y values of table D produces a consistent value of 48.
Hint 3:
The values in table D are inversely proportional because the product of the x and y values is a constant, 48. Choose answer choice D.

55.) "Thinking with Mathematical Models Investigation 3 #2" (Problem ID: 12844) RADIO_BUTTON [MA - 1998 - Spring - 26]

No knowledge components have been assigned

Rectangle with area 40 cm²

Length (cm)	1	2	4	5	8
Width (cm)	40	20	10	8	5

The table above shows the length and width of five rectangles with an area of 40 square centimeters. Which equation shows the relationship between length **l** and width **w**?

Answers: (Interface Type: RADIO_BUTTON)

✗ l / w = 40
✗ w / l = 40
✓ **l * w = 40**
✗ l = 40

Hint 1:
Notice that the product of the length and width is always 40.
Hint 2:
The equation representing the product of length and width being 40 can be written as:
l * w = 40.
Choose the answer choice l * w = 40.

56.) "Thinking with Mathematical Models Investigation 3 #1" (Problem ID: 12843) TEXT_FIELD [MA - 1998 - Spring - 26]

No knowledge components have been assigned

Rectangle with area 40 cm²

Length (cm)	1	2	4	5	8
Width (cm)	40	20	10	8	

The table above shows the length and width of a rectangle with area 40 square centimeters. What value should be in the shaded region of the table?

Answers: (Interface Type: TEXT_FIELD)

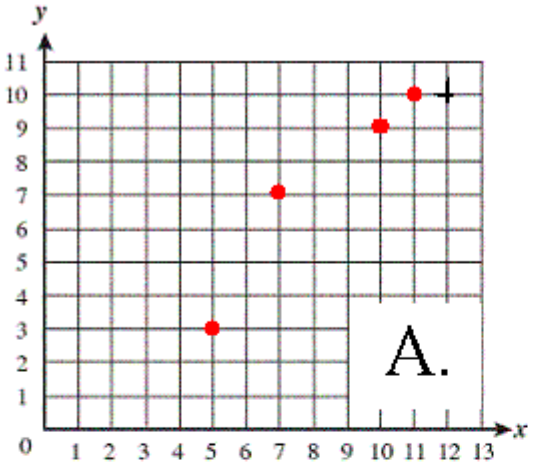
✓ **5**

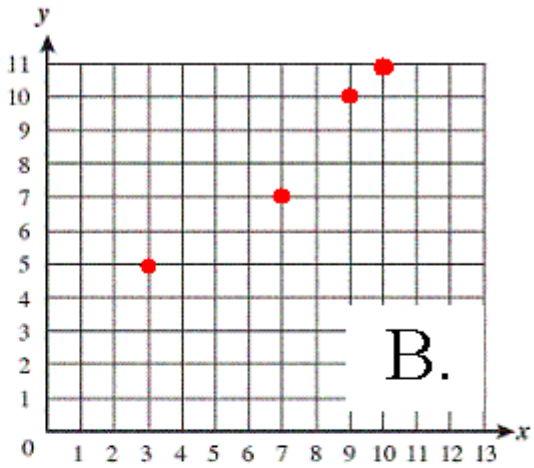
Hint 1:
Notice that the product of the length and width is always 40.
Hint 2:

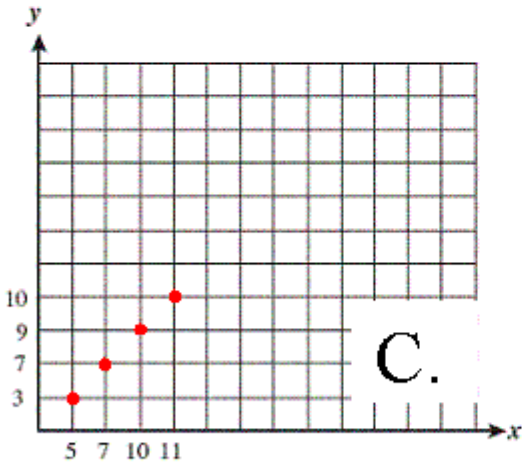
What times 8 is equal to 40?
Hint 3:
5 * 8 = 40. The correct answer is 5.
Type in 5.

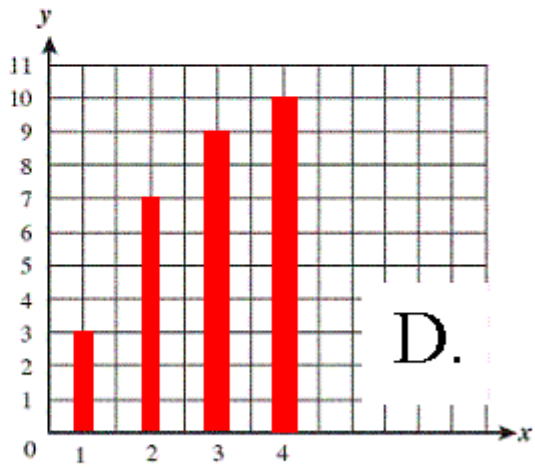
57.) "Thinking with Mathematical Models Investigation 1 #3" (Problem ID: 12842) RADIO_BUTTON [MA - 1999 - Spring - 4]

No knowledge components have been assigned









x	5	7	10	11
y	3	7	9	10

Which xy-graph correctly represents the data table above?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A**
✗ B *You seem to have switched the x-values and the y-values. Try again.*
✗ C *You can't have a scale that does not go up evenly and 5 to 7 to 10 to 11 is not even. Try again.*
✗ D *This is a bar graph, not an xy-graph.*

Hint 1:
Look for values of 5, 7, 10, and 11 on a correct scale.
Hint 2:

The answer is A. Type in A.

58.) "Thinking with Mathematical Models Investigation 1 #2" (Problem ID: 12841) RADIO_BUTTON [MA - 1999 - Spring - 4]

No knowledge components have been assigned

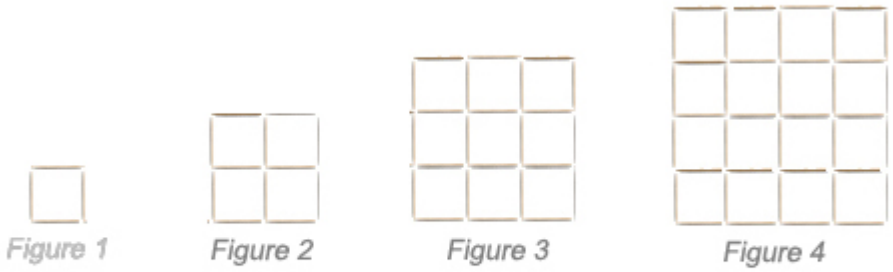


Figure	1	2	3	4	5
Blocks	1	4	9	16	25

An 8th grader in Mrs. Philips class made these patterns out of blocks. The first four images in the pattern are shown along with a table that shows how many blocks are needed for each figure.

Is the relationship between the figure numbers and the number of blocks linear?

Answers: (Interface Type: RADIO_BUTTON)

✗ Maybe

✓ **No**

✗ Yes

Hint 1:

A linear relationship means that the number of blocks increases by a constant value at each successive figure.

Hint 2:

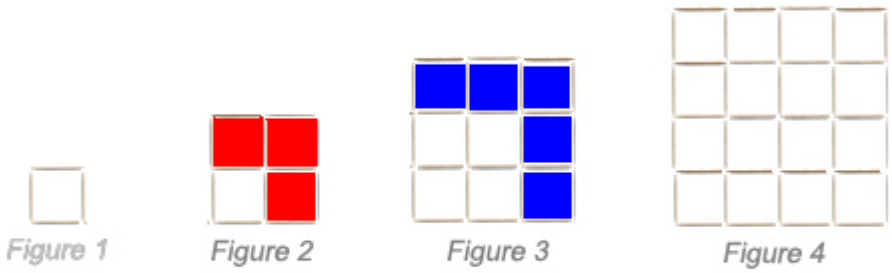


Figure	1	2	3	4	5
Blocks	1	4	9	16	25

As you can see from the image above, the difference between number of blocks in figure 1 and figure 2 is 3. The difference between number of toothpicks in figure 2 and figure 3 is 5.

Hint 3:
The increase is not a constant rate of change, therefore the figure number and number of blocks in the figure do not have a linear relationship.

59.) "Thinking with Mathematical Models Investigation 2 #6" (Problem ID: 12840) TEXT_FIELD

No knowledge components have been assigned

Tanika has saved $200 for dance classes. She spends $15 for each dance class. The equation that gives **t**, the money left in her savings, after she has taken **d** dance classes is:
t = 200 - 15d

How many classes has she taken if she has $95 left in her savings account?
Answers: (Interface Type: TEXT_FIELD)
✔ **7**

Hint 1:
t = 95. Substitute t in the equation for 95, then solve for d.
Hint 2:
Substituting t for 95 gives you the equation:
95 = 200 - 15d
To solve for d, you need to separate the unknown variable.
Hint 3:
Adding 15d to both sides gives you the equation:
15d + 95 = 200
Simplify it by subtracting both sides by 95.
Hint 4:
Subtracting both sides by 95 gives you the equation:
15d = 105
Solve for d by dividing both sides by 15.
Hint 5:
Dividing both sides by 15 gives you d = 7.
Type in 7.

60.) "Thinking with Mathematical Models Investigation 2 #5" (Problem ID: 12839) RADIO_BUTTON

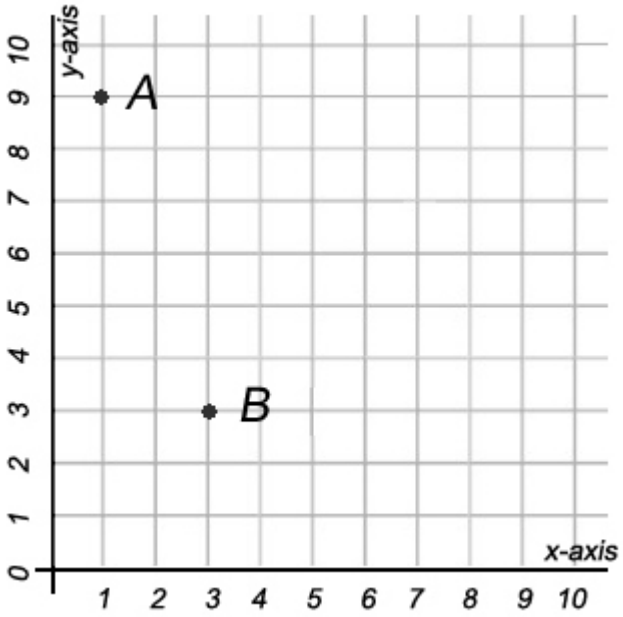
No knowledge components have been assigned

Tanika has saved $200 for dance classes. She spends $15 for each dance class. What equation gives **t**, the money left in her savings, after she has taken **d** dance classes?
Answers: (Interface Type: RADIO_BUTTON)
✔ **t = 200 - 15d**
✘ t = 200d - 15
✘ t = d - 200 * 15
✘ t = 200 - 15

Hint 1:
Tanika has $200 to start with, and spends 15 dollars for each class. Find how much she spends on classes if she has taken d classes.
Hint 2:
The total amount of money she spends on classes is 15d.
Hint 3:
The equation representing her savings is t = 200 - 15d. Choose the answer choice t = 200 -15d.

61.) "Thinking with Mathematical Models Investigation 2 #4" (Problem ID: 12838) RADIO_BUTTON [MA - 1999 - Spring - 4]

No knowledge components have been assigned

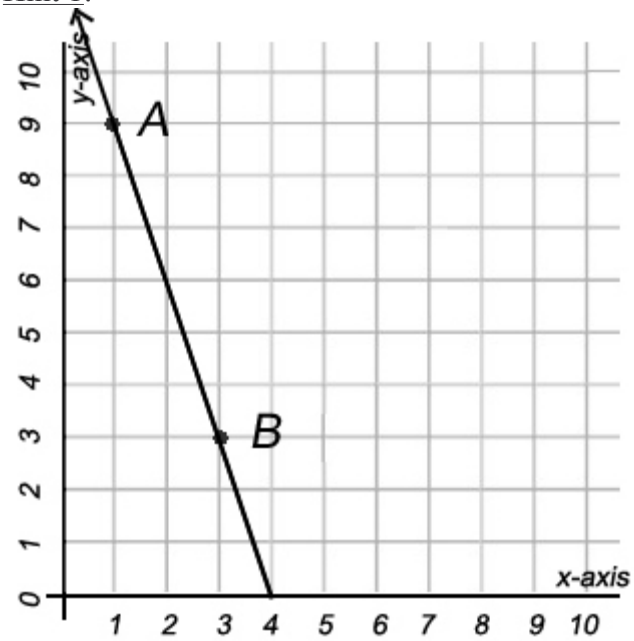


Given the graph above, which of the equations represents the line that goes through point A and point B.

Answers: (Interface Type: RADIO_BUTTON)

✗ A. y = 3x + 12
✗ B. y = 3x + 6
✓ **C. y = -3x + 12**
✗ D. y = -3x - 12

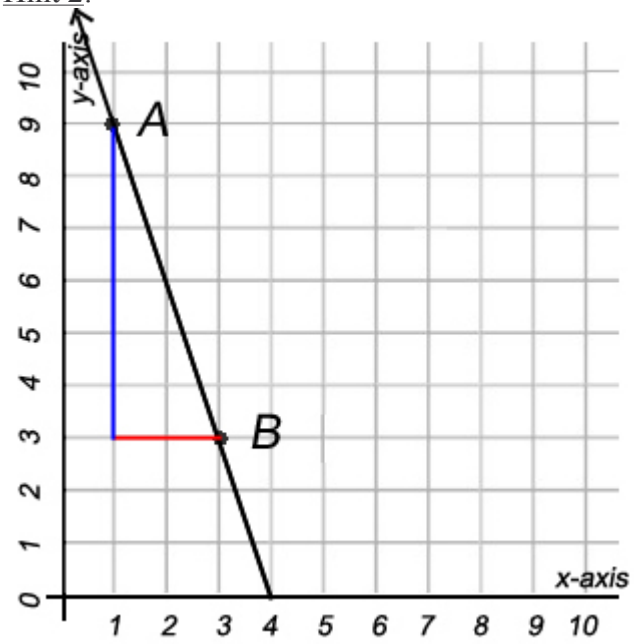
Hint 1:



Start by drawing the line that passes through point A and point B. To find the equation, you

should start by finding the slope. You have two points (3, 3) and (1, 9) which you can use to do that. Once the slope is found, you can use it to find where it intersects the y-axis. This gives you everything you need to fill in the y=mx+b equation form.

Hint 2:

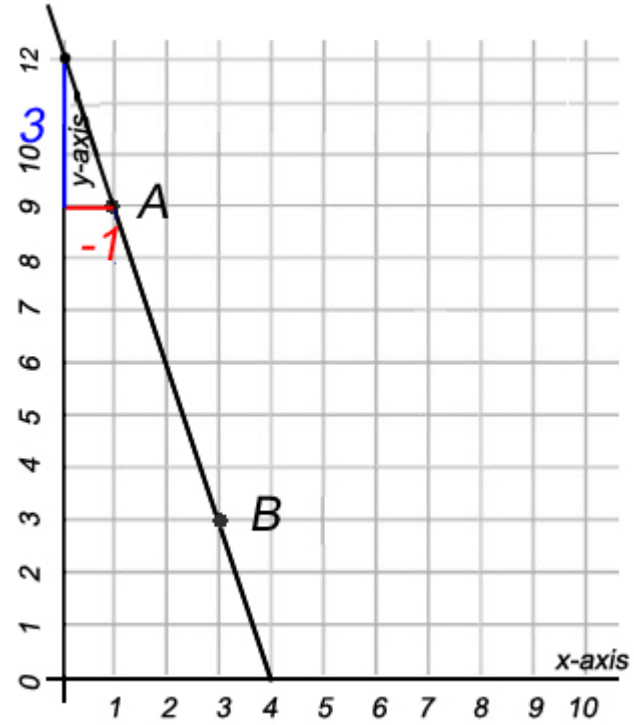


Let's start by finding the slope. You have two points, A and B. To find the slope, count the rise and the run in the image above.

Hint 3:

The slope is 3/-1 which is equal to -3. Notice that the line goes down from left to right, confirming that the slope is negative. Now that we have the slope, we need to find the y-intercept.

Hint 4:



The y-intercept can be found by starting at the point (1, 9) and using the slope to find the next

point. Since the slope is 3/-1, we subtract 1 from the x-coordinate and add 3 to the y-coordinate, giving us (0, 12). The y-intercept is 12!
Hint 5:
To find the equation, plug in the slope and y-intercept into the form y=mx+b.
Hint 6:
Plugging in the slope of -3 and the y-intercept of 12 gives you the equation:
y = -3x + 12
Choose the answer choice y=-3x+12.

62.) "Thinking with Mathematical Models Investigation 1 #1" (Problem ID: 12809) TEXT_FIELD

No knowledge components have been assigned

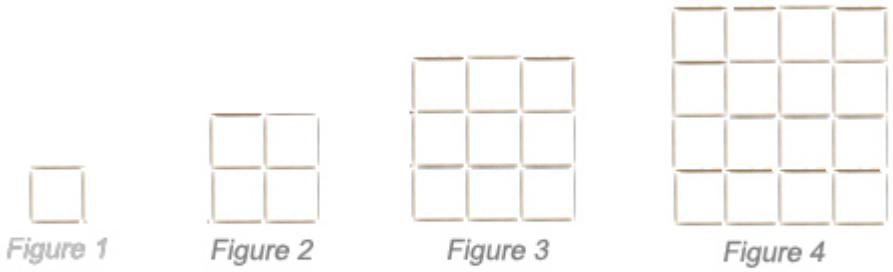


Figure	1	2	3	4	5
Blocks					

An 8th grader in Mrs. Philips class made these patterns out of blocks. The first four images in the pattern are shown. Fill in the table with how many blocks are in each figure by looking at the pictures. What value should go in the shaded box in the table?
Answers: (Interface Type: TEXT_FIELD)
✓ **25**

Hint 1:
Notice that the number of blocks for each figure is the perfect square of the figure number! This makes sense because the pictures are squares.
Hint 2:
The correct answer is '25'. Please enter/select '25' (without quotes).

63.) "Thinking with Mathematical Models Investigation 2 #3" (Problem ID: 12808) TEXT_FIELD

No knowledge components have been assigned

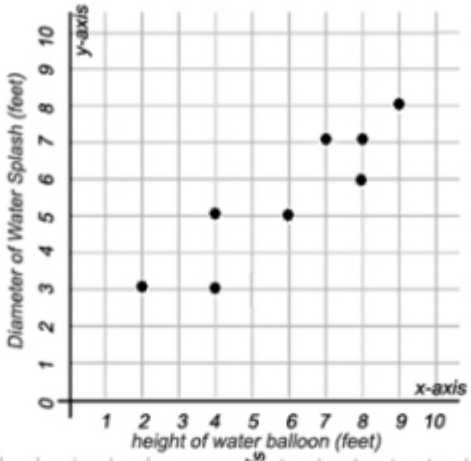
Jill's science class was dropping water balloons from different heights and measuring the diameter of the splash.

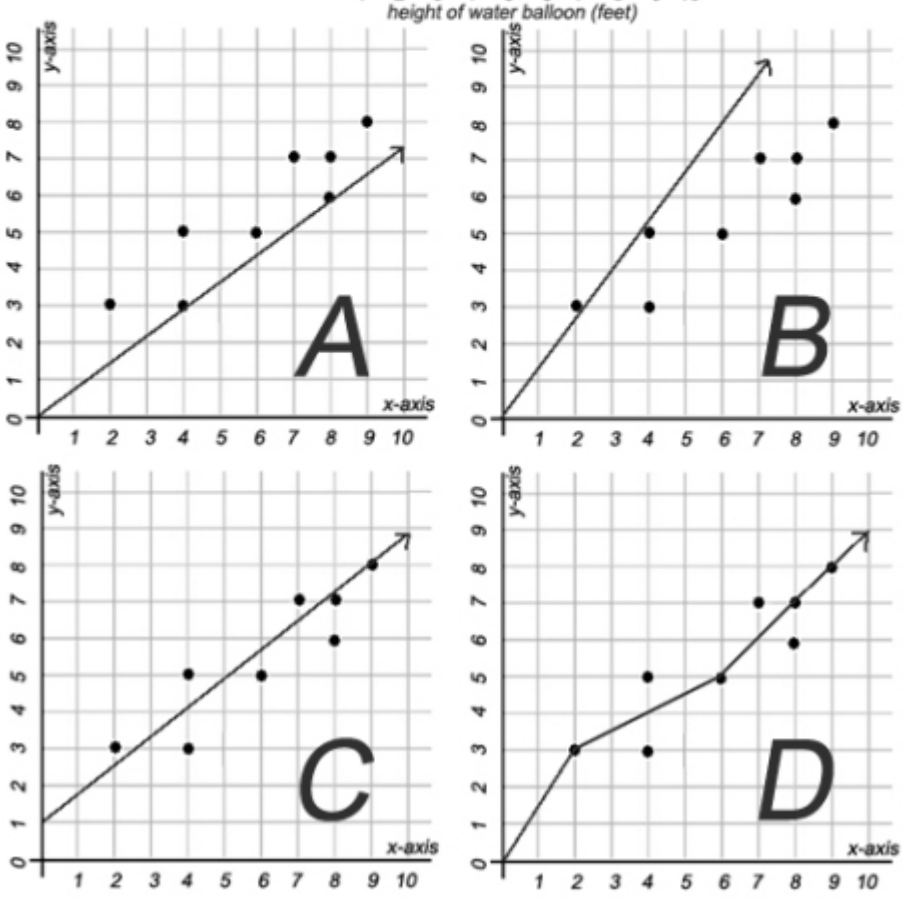
The equation of the line of best fit for this data is **y = 3/4 * x + 1** where x is the height of the drop and y is the diameter of the splash. Use this equation to predict how many feet the diameter of the splash is; assuming the water balloon was dropped from 16 feet.
Answers: (Interface Type: TEXT_FIELD)
✓ **13**

Hint 1:
Substitute x in the equation with 16:
y = 3/4 * x + 1
Hint 2:
y = 3/4 * 16 + 1
Hint 3:
y = 48/4 + 1
Hint 4:
y = 12 + 1 = 13
Hint 5:
The correct answer is 13. Type in 13.

64.) "Thinking with Mathematical Models Investigation 2 #1" (Problem ID: 12807) RADIO_BUTTON [MA - 2005 - Spring - 39]

No knowledge components have been assigned





Jill's science class was dropping water balloons from different heights and measuring the diameter of the splash. The scatter plot shows the data they collected after 8 drops. Which of the above graphs shows the model of a line that best fits the data?

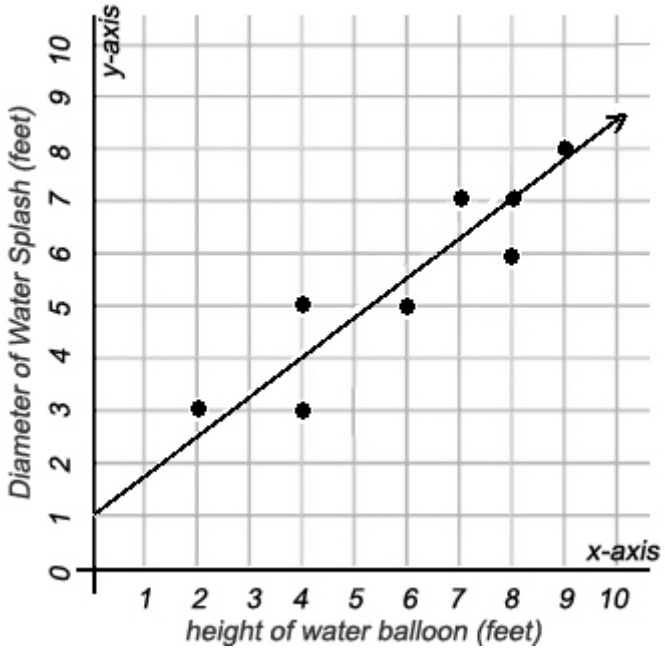
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ **C**
✗ D

Hint 1:
A line of best fit is a straight line that best represents the data on a scatter plot.
Hint 2:
The correct answer is 'C'.

65.) "Thinking with Mathematical Models Investigation 2 #2" (Problem ID: 12806) RADIO_BUTTON

No knowledge components have been assigned



Jill's science class was dropping water balloons from different heights and measuring the diameter of the splash. The graph above shows the data they collected after 8 drops and the best fit line.

Finish the equation for the best fit line in terms of x:
y = _____.

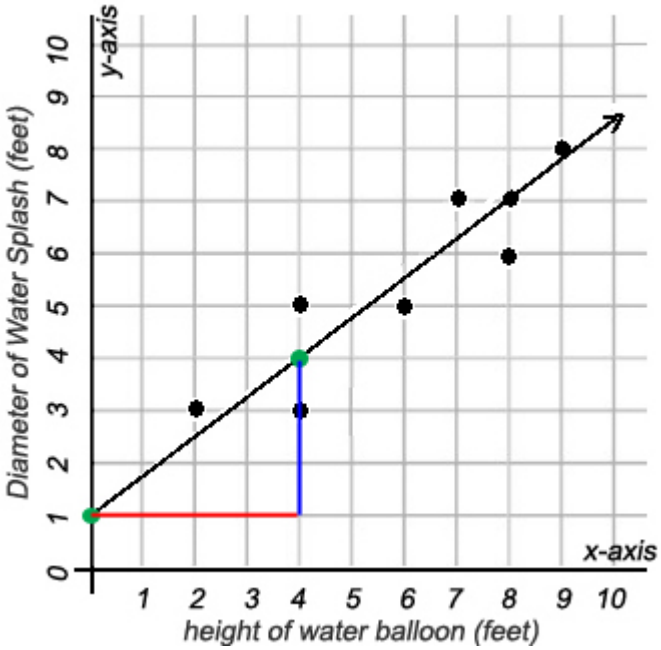
Answers: (Interface Type: RADIO_BUTTON)

✗ A. 3/4 * x
✓ **B. 3/4 * x +1**
✗ C. 4/3 * x
✗ D. 4/3 * x + 1

Hint 1:
To find the equation of a line, you can use the y=mx+b form equation. To fill in the equation, you need the slope, m, and y-intercept, b, of the line.

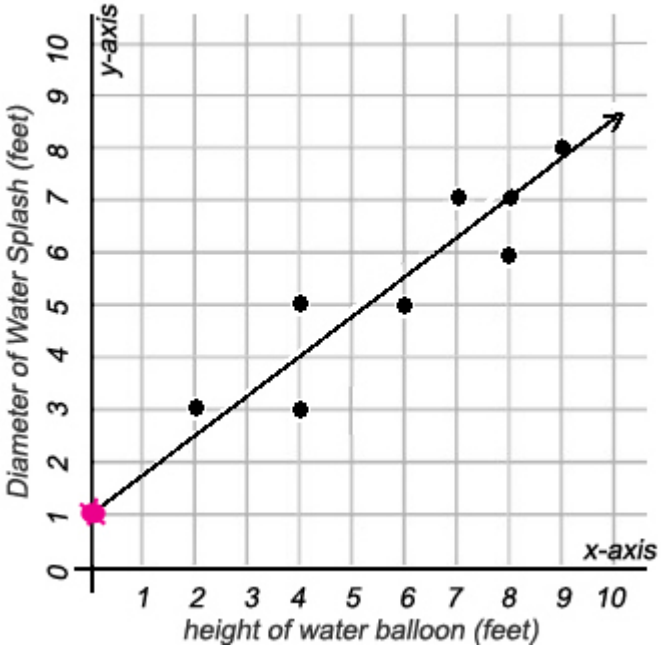
Hint 2:
First, let's start by finding the slope, m. The slope of the line can be found by taking two points and counting the rise and the run.

Hint 3:



Here is an example of two points you could have chosen to find the slope. You can find the rise by counting the blue line, and the run by counting the red line. The slope is the rise over the run, which is 3/4. now that you have found the slope, find the y-intercept.

Hint 4:



We know that the answer is either A or B because the slope must be 3/4. The line intersects the y-axis at the pink dot on the graph. The y-intercept is 1 because the line intersects the y-axis at 1.

Hint 5:

The answer choice B, y = 3/4 *x + 1, is correct. The slope in this equation is 3/4 and the y-intercept is 1. Choose answer choice B.

End Random Order Section

End Linear Section

Home [FAQ]

Module Worksheet

Logout

Mr. Zhang

You are currently at: **Curriculum Pretty-Print**

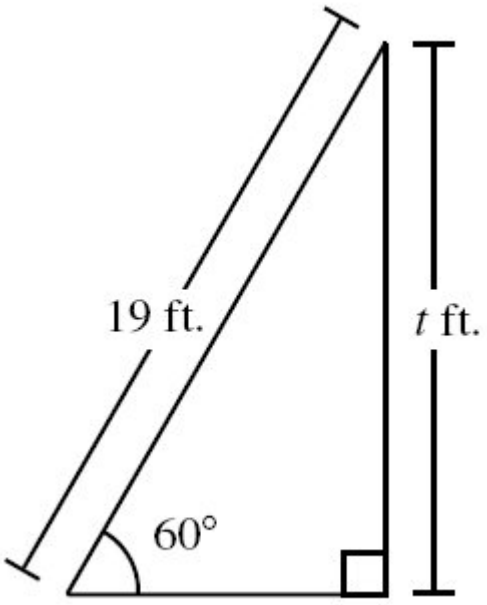
Module Name: 10thGradeGeometry_IQP

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section
Begin Linear Section
Begin Random Order Section

1.) "pre_2006m_38_gr10_calc" (Problem ID: 21700) RADIO_BUTTON [MA - 2006 - MAR - 38]

No knowledge components have been assigned



Which of the following is closest to the value of t for the triangle with the dimensions shown above?

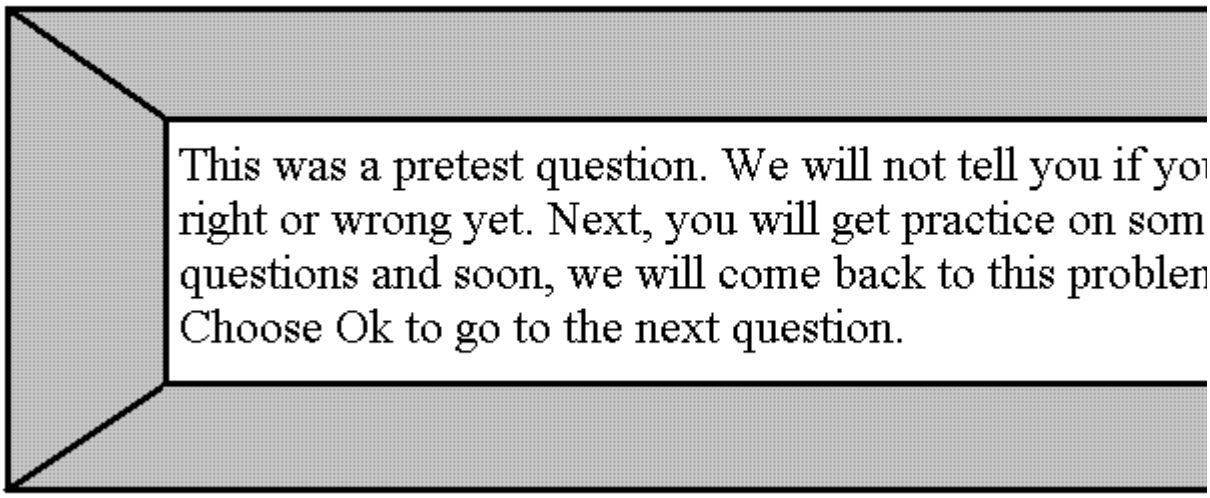
Answers: (Interface Type: RADIO_BUTTON)

✗ A. 9.5
✗ B. 13.4
✗ C. 15.2
✓ **D. 16.5**

(Problem ID: 21701) RADIO_BUTTON [MA - 2006 - MAR - 38]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

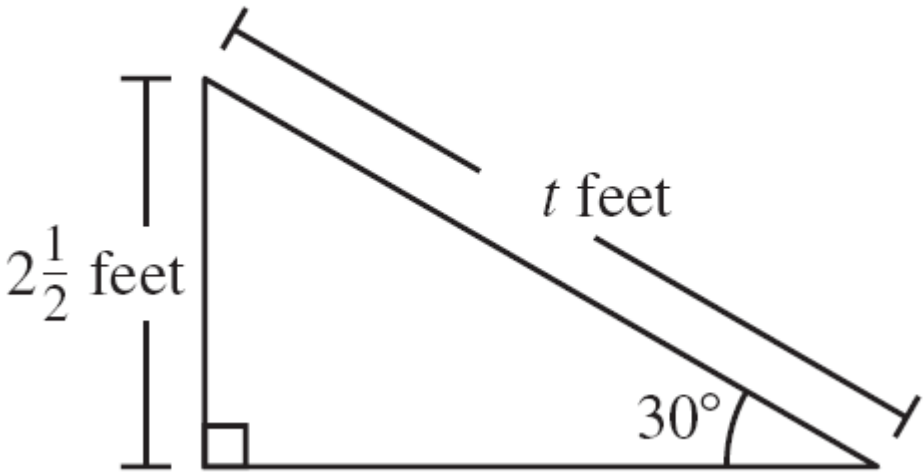
We will come back to this problem later. Choose Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

2.) "2006_16_gr10_nocalc" (Problem ID: 13688) TEXT_FIELD [MA - 2006 - SPRING - 16]

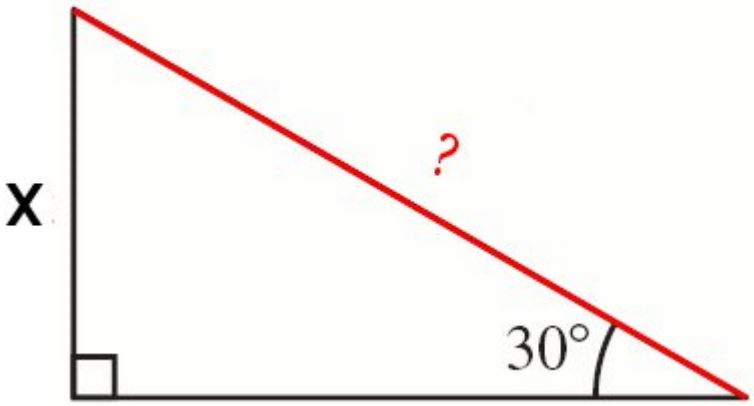
No knowledge components have been assigned

Jeffrey's Ramp Design



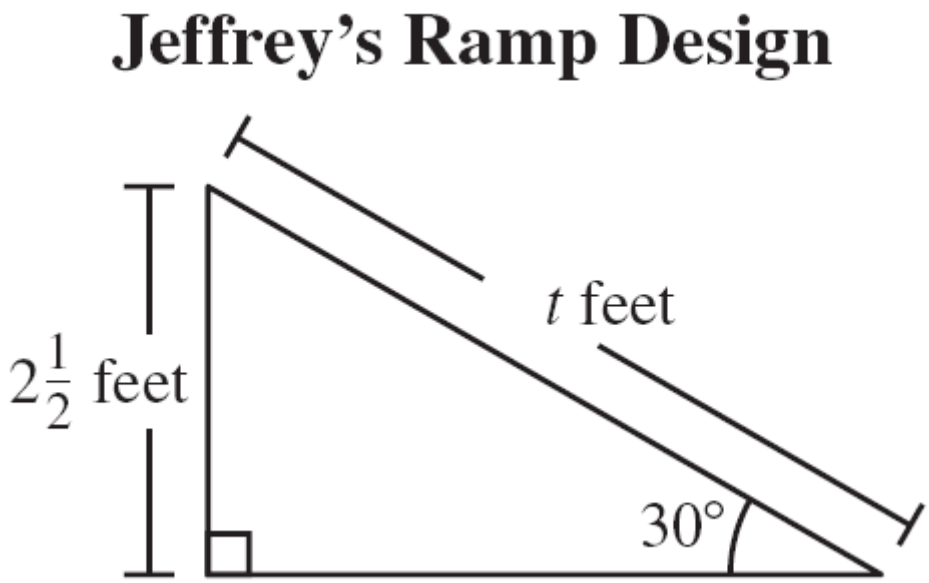
Jeffrey wants to build a ramp to make it easier to load his lawn mower into the back of his truck. He drew the diagram above to help him design the ramp. What is t, the length in feet of the ramp?
Answers: (Interface Type: TEXT_FIELD)
✓ **5**

(Problem ID: 13689) RADIO_BUTTON [MA - 2006 - SPRING - 16]



The triangle given is a special right triangle. If the short leg of a 30, 60, 90 triangle is **x**, what is the length of the hypotenuse (shown in red)?

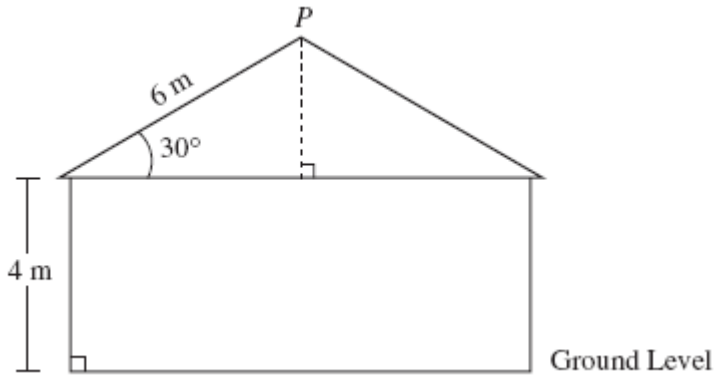
(Problem ID: 13690) TEXT_FIELD [MA - 2006 - SPRING - 16]



Use this relationship to find the length of t. (We know the short leg of the 30, 60, 90 triangle to be 2.5 feet.)

3.) "2005_29_gr10_calc" (Problem ID: 13139) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

No knowledge components have been assigned



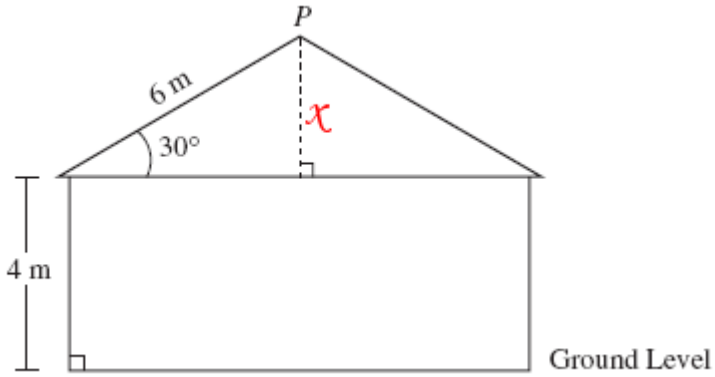
The diagram above show the side view of a house. The base of its roof is 4 meters above ground level.

Point P is the highest point on the roof. Based on the diagram, what is the distance from P to the ground level?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ 7

(Problem ID: 13140) ALGEBRA_FIELD [MA - 2005 - Spring - 29]



Find **x**

Once x is found, it can be added to the rest of the height of the house, which we already know.

What is x?

(Problem ID: 13142) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

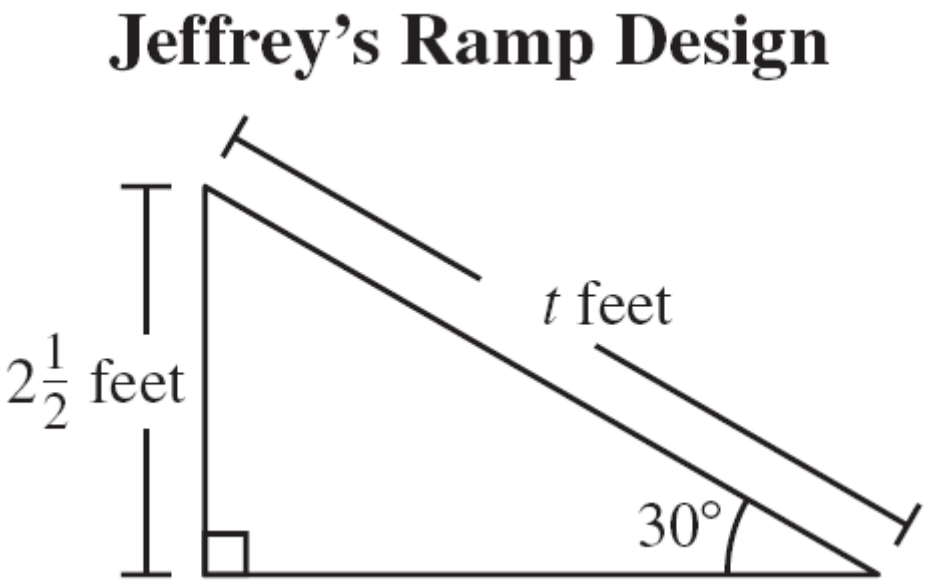
x is now known and is the height from the base of the roof to the top of the house. We also know the height from the ground level to the base of the roof.

What is the height of the house?

End Random Order Section Begin Random Order Section

4.) "2006_16_gr10_nocalc_HINT" (Problem ID: 15479) TEXT_FIELD [MA - 2006 - SPRING - 16]

No knowledge components have been assigned



Jeffrey wants to build a ramp to make it easier to load his lawn mower into the back of his truck. He drew the diagram above to help him design the ramp. What is t, the length in feet of the ramp?

Answers: (Interface Type: TEXT_FIELD)

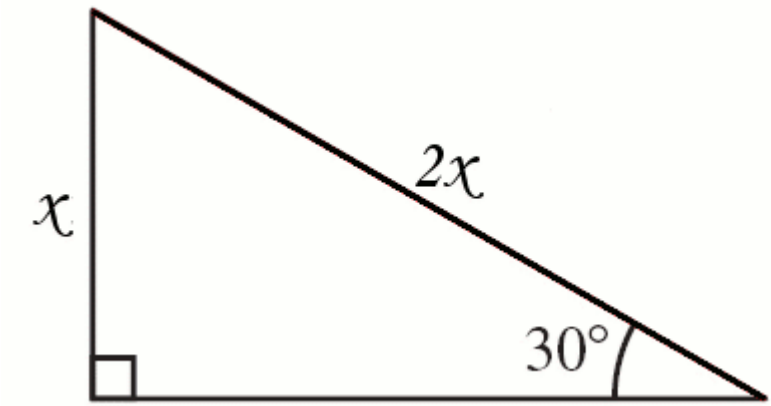
✔ **5**

Hint 1:

The figure above is a special right triangle called a 30-60-90 triangle. Using the properties of a 30-60-90 triangle, establish a relationship between the side we know (the side opposite the 30? angle) and the side we wish to know (the opposite the 90? angle)

Refer to your reference sheet for the relationships in a 30-60-90 triangle.

Hint 2:



From the figure above, we can conclude that whatever the side opposite the 30? angle is, the hypotenuse (opposite the 90? angle) is going to be double.

Use this relationship to find t, the hypotenuse of the 30-60-90 triangle.

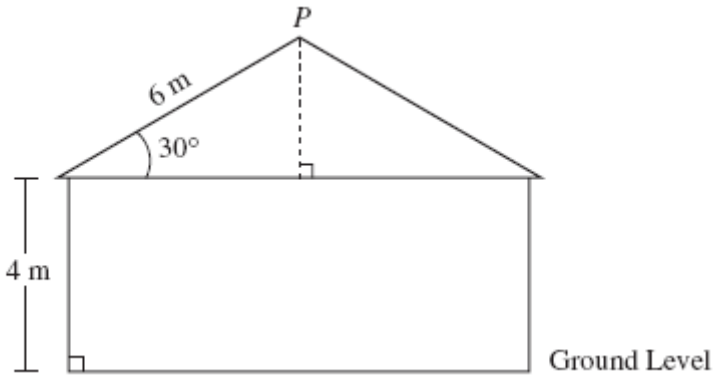
Hint 3:

t = 2 ? (2 1/2) = 5.

The value of t is 5

5.) "2005_29_gr10_calc_HINT" (Problem ID: 15482) ALGEBRA_FIELD [MA - 2005 - Spring - 29]

No knowledge components have been assigned



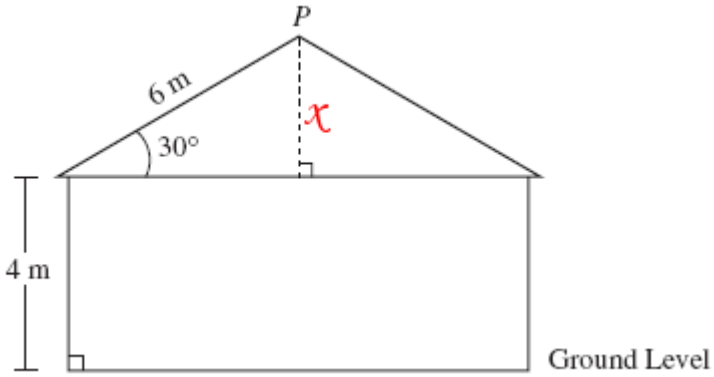
The diagram above show the side view of a house. The base of its roof is 4 meters above ground level.

Point P is the highest point on the roof. Based on the diagram, what is the distance from P to the ground level?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **7**

Hint 1:

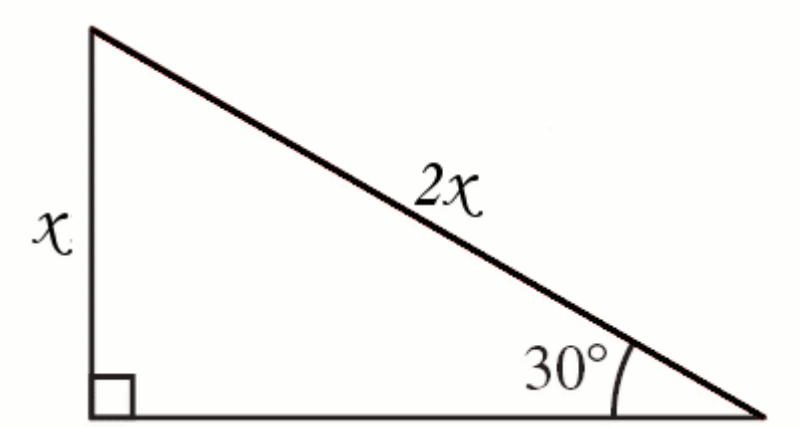


To solve this problem, we are going to need to find the length of x (marked in the figure above) and add it to the rest of the height

Hint 2:

x makes up the side of a 30-60-90 triangle. Using the properties of a 30-60-90 triangle, establish a relationship between x and the known value of the hypotenuse, 6.

Hint 3:



From the figure above, we can conclude that the side opposite the 30? angle is half that of the hypotenuse.

Now solve for x.
Hint 4:
6/2 = 3

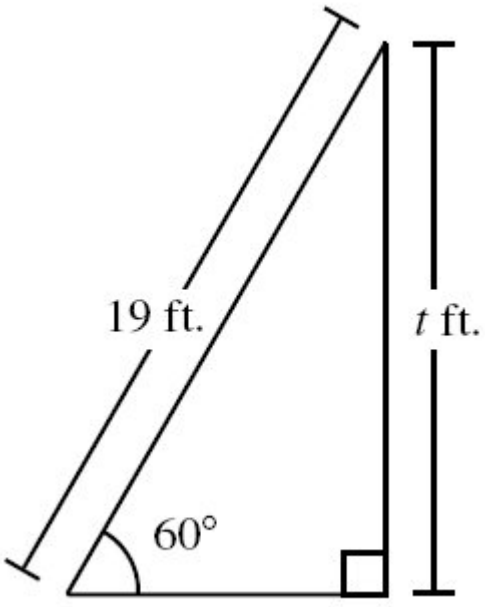
Now add 3 to the rest of the height of the house. This will give us the full height of the house. This is the distance from P to the ground level.
Hint 5:
3 + 4 = 7

The answer is 7.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

6.) "2006m_38_gr10_calc" (Problem ID: 14099) RADIO_BUTTON [MA - 2006 - MAR - 38]

No knowledge components have been assigned



Which of the following is closest to the value of t for the triangle with the dimensions shown above?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 9.5**
✗ **B. 13.4**
✗ **C. 15.2**
✓ **D. 16.5**

(Problem ID: 14100) RADIO_BUTTON [MA - 2006 - MAR - 38]

No knowledge components have been assigned

$A.\ \frac{1}{2}(19)$

$B.\ \sqrt{3} * 19$

$C.\ 2 * 19$

$D.\ \frac{\sqrt{3}}{2} * 19$

This is a special right triangle, refer to your reference sheet. We know the value of the hypotenuse, which expression above must we solve to get the value of the long leg, t?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14101) RADIO_BUTTON [MA - 2006 - MAR - 38]

No knowledge components have been assigned

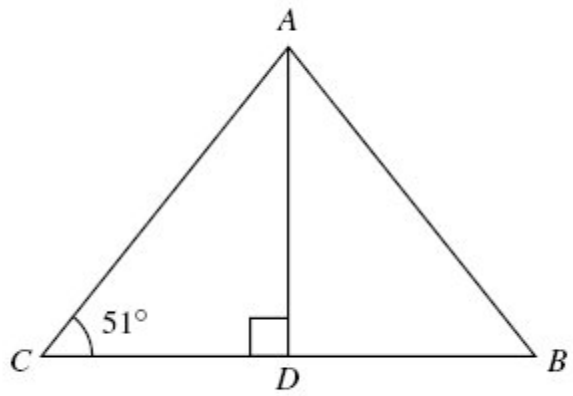
Now, find t. Which of the following values is it closest to?
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

7.) "pre_2005m_16_gr10_nocalc" (Problem ID: 21661) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned

In $\triangle ABC$ shown below, $\overline{AD}$ is the perpendicular bisector of $\overline{CB}$.



What is the measure, in degrees, of $\angle CAB$?

Answers: **(Interface Type: TEXT_FIELD)**
✓ **78**

(Problem ID: 21662) RADIO_BUTTON [MA - 2005 - MAR - 16]
No knowledge components have been assigned

Pretest Question

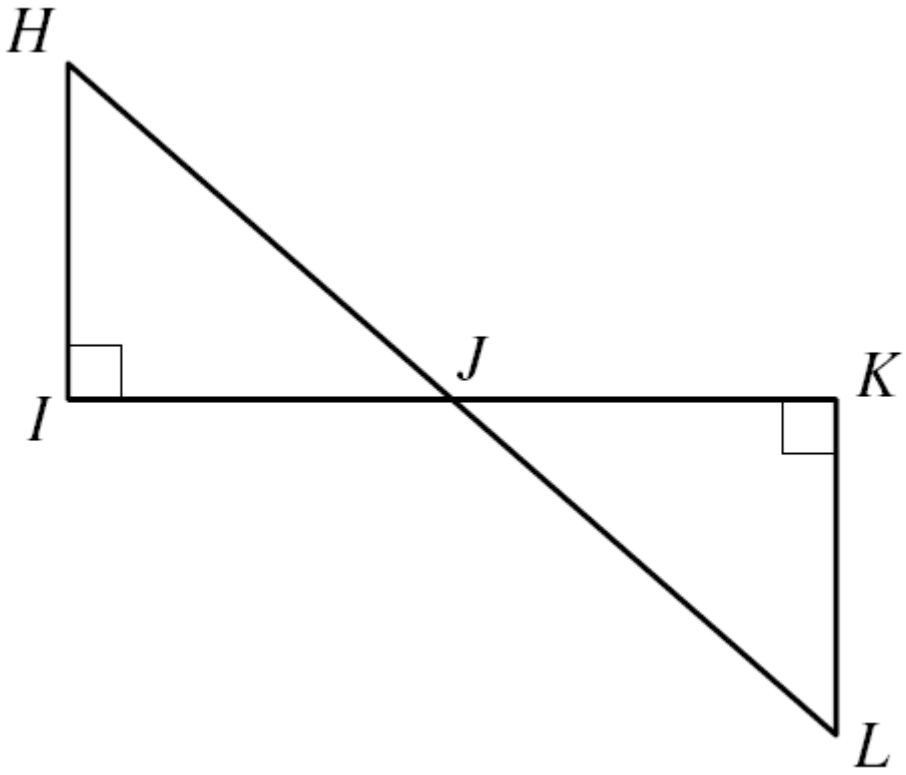
This was a pretest question. We will not tell you if yo
right or wrong yet. Next, you will get practice on som
questions and soon, we will come back to this proble
Choose Ok to go to the next question.

Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit to continue.
Answers: **(Interface Type: RADIO_BUTTON)**

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

8.) "2005Nov_05_gr10_nocalc" (Problem ID: 13685) RADIO_BUTTON [MA - 2005 - NOV - 5]
No knowledge components have been assigned



In the figure above, triangle HIJ is congruent to triangle LKJ. If the measure of angle L is 50 degrees, what is the measure of angle IJH?

Answers: (Interface Type: RADIO_BUTTON)

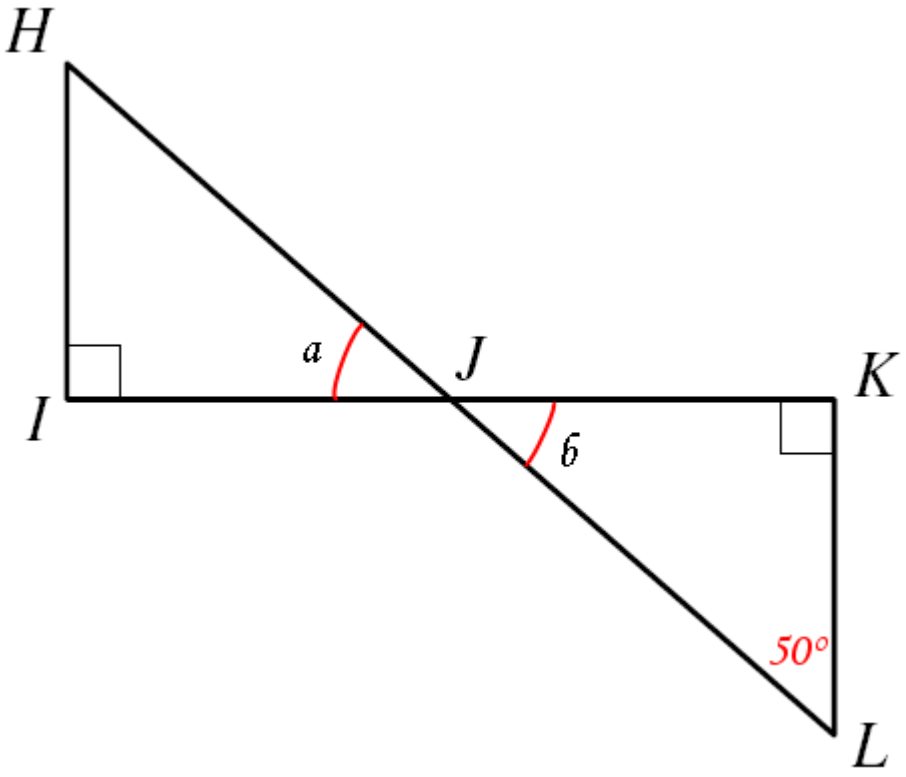
- ✗ **A. 35**
- ✓ **B. 40**
- ✗ **C. 45**
- ✗ **D. 50**

(Problem ID: 13686) RADIO_BUTTON [MA - 2005 - NOV - 5]

First, it always helps to draw a sketch. Draw the original picture and mark what you know from the problem and mark what you are looking for.

What is the best way to describe the way in which angles IJH (let's call it a) and KJL (let's call it b) relate?

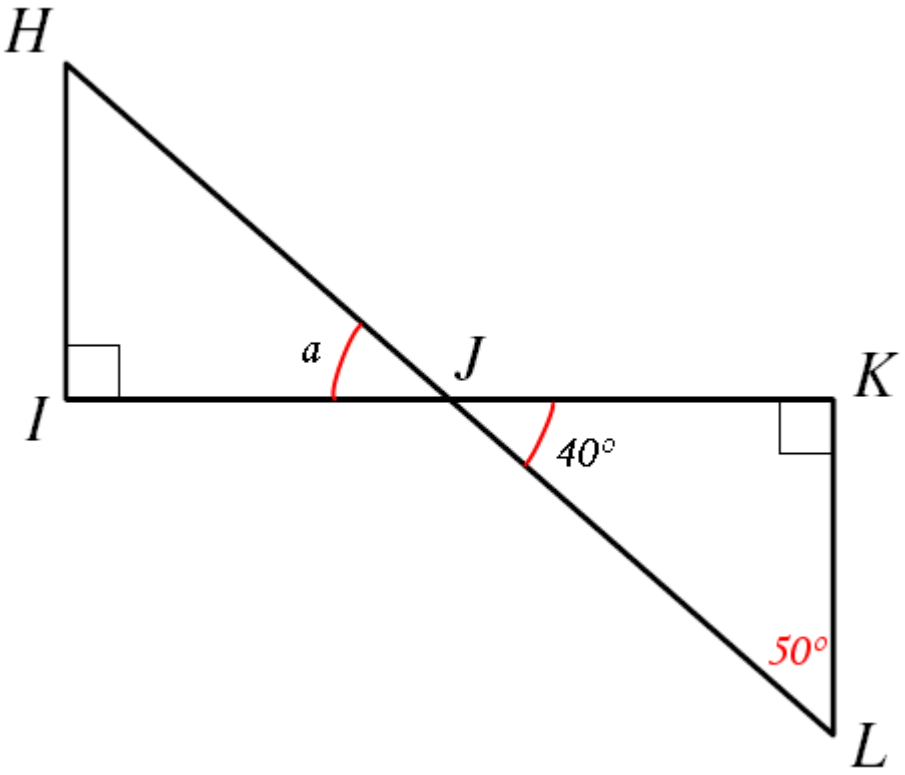
(Problem ID: 13687) TEXT_FIELD [MA - 2005 - NOV - 5]



Now we know and b are vertical angles and since vertical angles are congruent, we can determine a if we know b.

How many degrees is the measure of angle b?

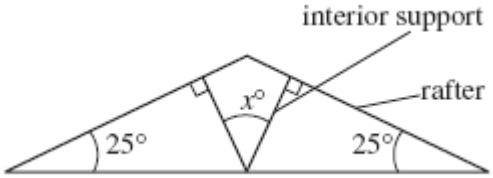
(Problem ID: 13867) RADIO_BUTTON [MA - 2005 - NOV - 5]



Let's go back to the original question now with all of this information in mind. What is the measure of angle IJH? (denoted as a in the sketch above)

9.) "2005_38_gr10_calc" (Problem ID: 13617) RADIO_BUTTON [MA - 2005 - Spring - 38]

No knowledge components have been assigned



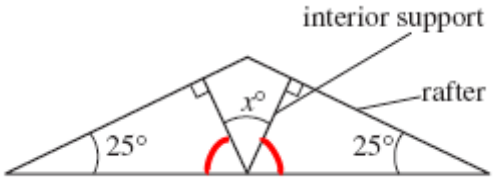
Each of the two interior supports for part of a roof is perpendicular to a rafter, as shown above.

Find x.

Answers: (Interface Type: RADIO_BUTTON)

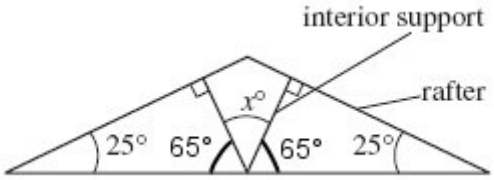
- ✓ **A. 50**
- ✗ **B. 65**
- ✗ **C. 90**
- ✗ **D. 130**

(Problem ID: 13627) TEXT_FIELD [MA - 2005 - Spring - 38]



To find x, it will be helpful to know the angles in red. Make a sketch so you can put in the new information as you get it. Find the measure of one of these angles (they will be equal due to symmetry)

(Problem ID: 13628) RADIO_BUTTON [MA - 2005 - Spring - 38]

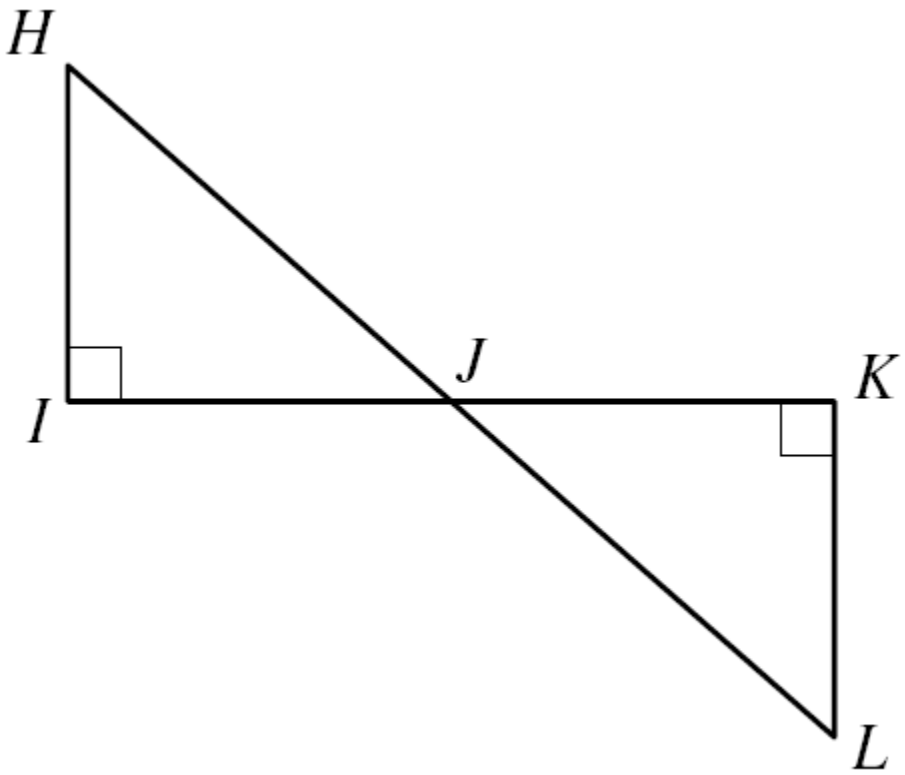


Now that the measure of those angles are known to each be 65 (label them on your sheet), we should be able to find out what x is. Find x.

End Random Order Section Begin Random Order Section

10.) "2005Nov_05_gr10_nocalc_HINT" (Problem ID: 15485) RADIO_BUTTON [MA - 2005 - NOV - 5]

No knowledge components have been assigned

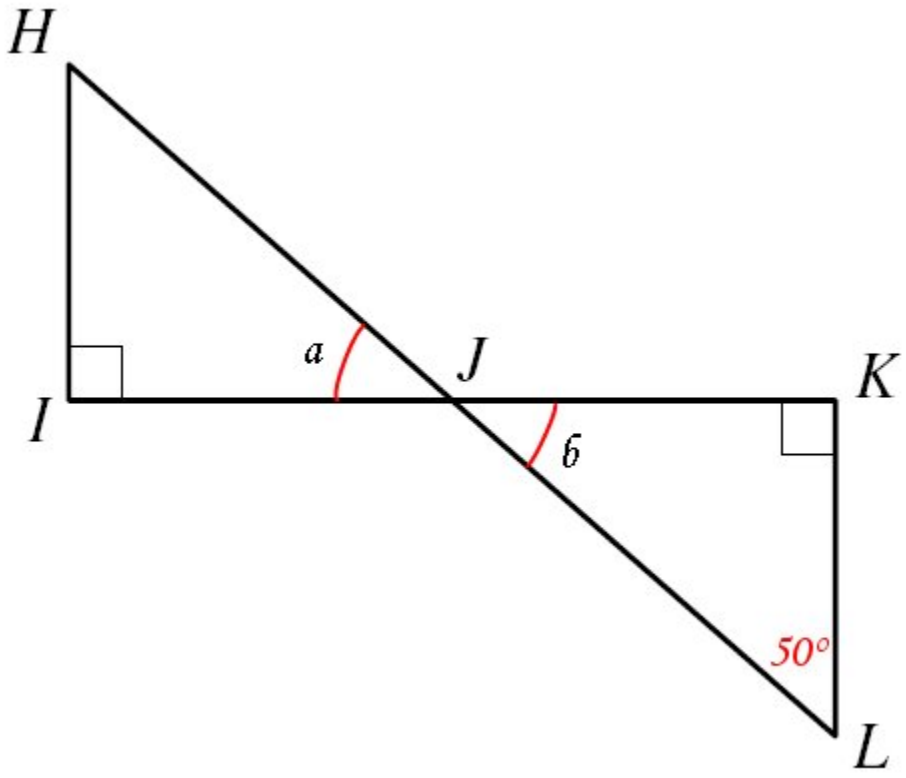


In the figure above, triangle HIJ is congruent to triangle LKJ. If the measure of angle L is 50 degrees, what is the measure of angle IJH?

Answers: (Interface Type: RADIO_BUTTON)

- ✗ **A. 35**
- ✓ **B. 40**
- ✗ **C. 45**
- ✗ **D. 50**

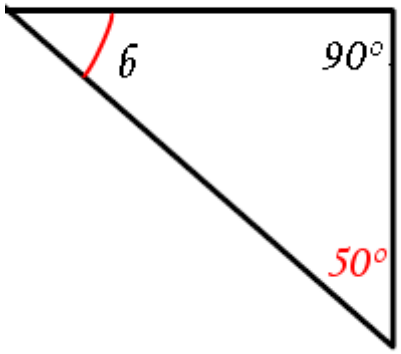
Hint 1:



It is always helpful to draw a sketch. Let's label the measure of angle L and add some other labels.

We need to find the measure of angle IJH, which we've labelled as a. First, we'll need to find the measure of angle KJL, labelled as b

Hint 2:



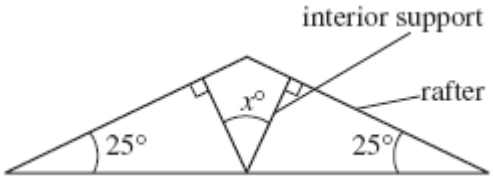
To find b, we can use the sum of the interior angles of a triangle.
Hint 3:
90 + 50 + b = 180
b = 40

Now that we know b, let's find the measure of a.
Hint 4:
Angles a and b are *vertical angles* This means that they are equal.
Hint 5:
a = b and b = 40. So a = 40

a is the angle of IJH. So the answer is 40.

11.) "2005_38_gr10_calc_HINT" (Problem ID: 15489) RADIO_BUTTON [MA - 2005 - Spring - 38]

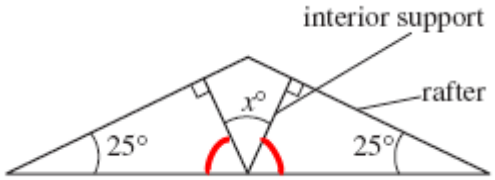
No knowledge components have been assigned



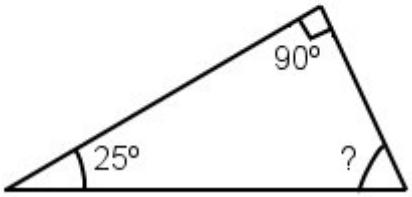
Each of the two interior supports for part of a roof is perpendicular to a rafter, as shown above.

Find x.
Answers: (Interface Type: RADIO_BUTTON)
✔ **A. 50**
✘ **B. 65**
✘ **C. 90**
✘ **D. 130**

Hint 1:



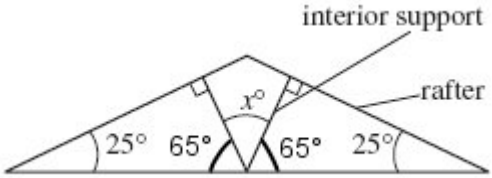
To find x, first find the angles marked in red.
Hint 2:



The sum of the interior angles of a triangle is 180. Use this fact to find the angles in red.
Hint 3:
For one of the angles in red,

25 + 90 + ? = 180
The angle is equal to 65
The red angles equal each other due to symmetry

Now we can find x.
Hint 4:



The sum of the angles that were found and x should equal 180.

65 + 65 + x = 180
Hint 5:
x = 180 - 65 - 65 = 50

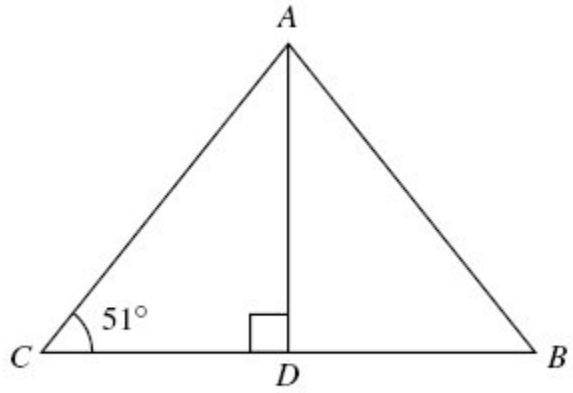
The answer is 50.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

12.) "2005m_16_gr10_nocalc" (Problem ID: 14084) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned

In $\triangle ABC$ shown below, $\overline{AD}$ is the perpendicular bisector of $\overline{CB}$.



What is the measure, in degrees, of $\angle CAB$?

Answers: **(Interface Type: TEXT_FIELD)**
✓ **78**

(Problem ID: 14085) TEXT_FIELD [MA - 2005 - MAR - 16]

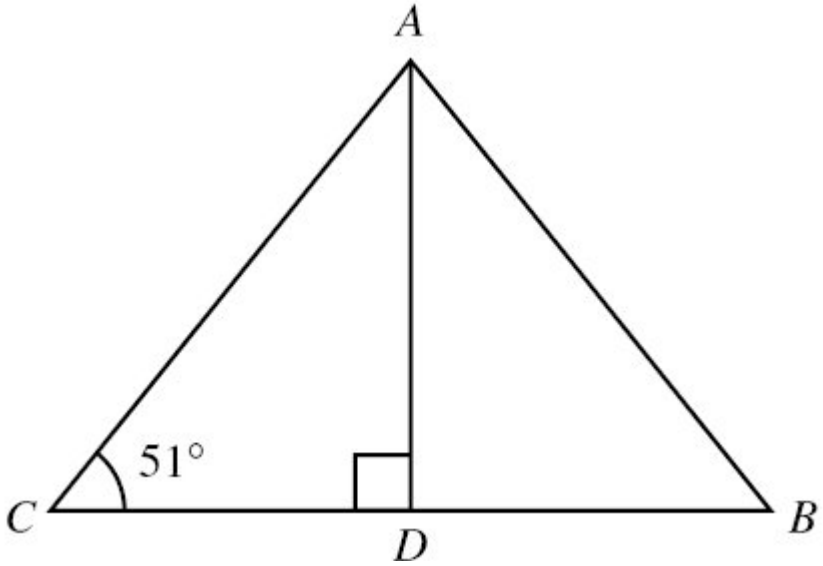
No knowledge components have been assigned

To find CAB, we need to find CAD and DAB. How many degrees is the measure of angle CAD?

Answers: **(Interface Type: TEXT_FIELD)**

(Problem ID: 14086) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned

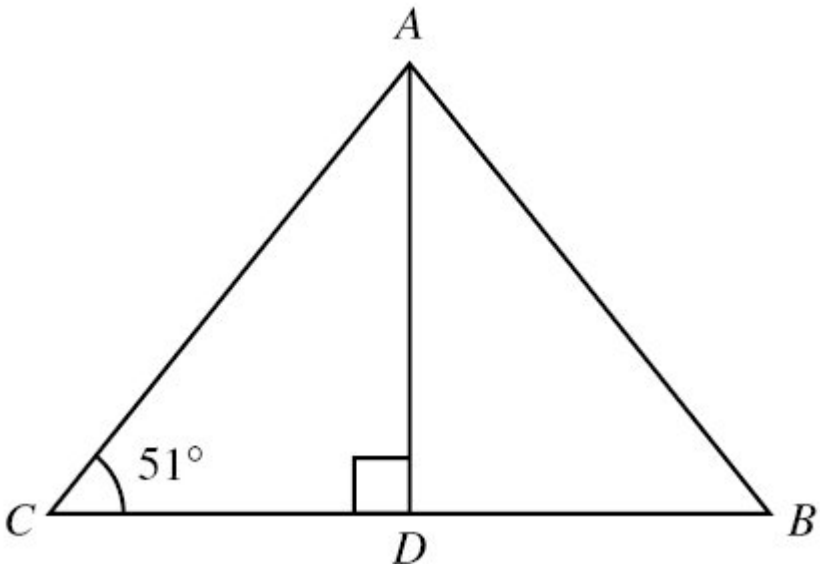


Now that we have found angle CAD, find the measure of angle DAB.

Answers: **(Interface Type: TEXT_FIELD)**

(Problem ID: 14087) TEXT_FIELD [MA - 2005 - MAR - 16]

No knowledge components have been assigned



Returning to the initial question, angles CAD and BAD both measure 39?. What is the measure of angle CAB?

Answers: (Interface Type: TEXT_FIELD)

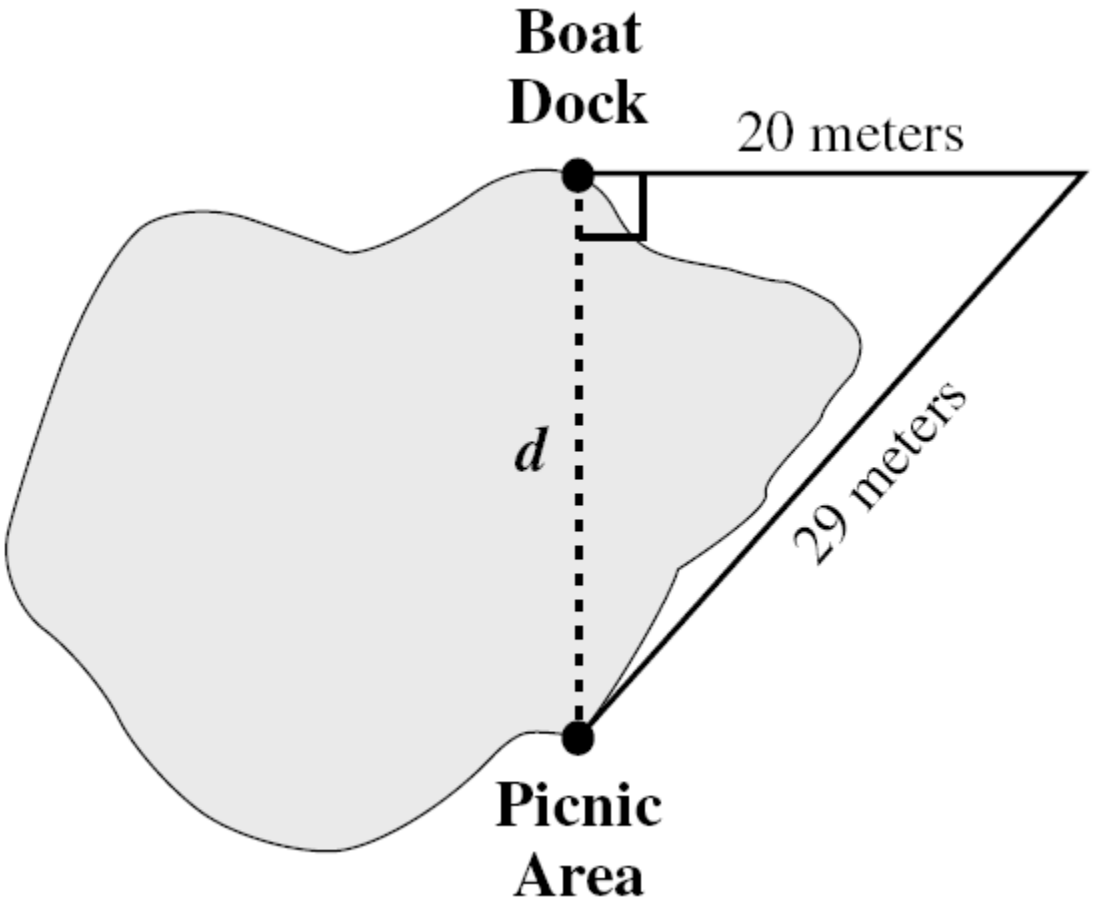
End Random Order Section

End Linear Section Begin Linear Section

Begin Random Order Section

13.) "pre_2005Nov_25_gr10_calc" (Problem ID: 21720) RADIO_BUTTON

No knowledge components have been assigned



Malik used the measurements shown in the diagram above to find the distance across a pond between a boat dock and a picnic area.

What is d, the distance between these two points?
Answers: (Interface Type: RADIO_BUTTON)
- ✗ **A. 18 meters**
- ✗ **B. 21 meters**
- ✗ **C. 25 meters**
- ✗ **D. 49 meters**

(Problem ID: 21721) RADIO_BUTTON

No knowledge components have been assigned

Pretest Question

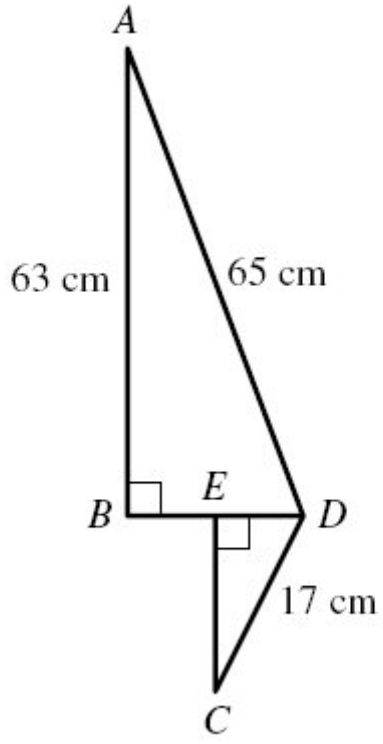
This was a pretest question. We will not tell you if yo
right or wrong yet. Next, you will get practice on som
questions and soon, we will come back to this problen
Choose Ok to go to the next question.

Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

14.) "pre_2005m_33_gr10_calc" (Problem ID: 21740) RADIO_BUTTON [MA - 2005 - MAR - 33]

No knowledge components have been assigned



In the figure above, E is the midpoint of BD.

What is the length of CE?

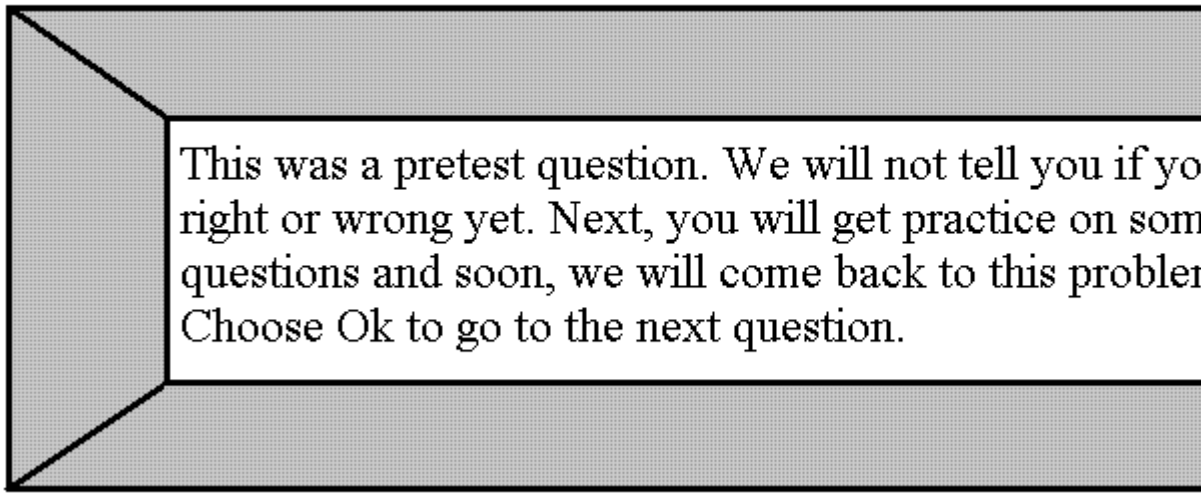
Answers: (Interface Type: RADIO_BUTTON)

- ✗ A. 5.7 cm
- ✗ B. 8 cm
- ✗ C. 15 cm
- ✗ D. 18.8 cm

(Problem ID: 21741) RADIO_BUTTON **[MA - 2005 - MAR - 33]**

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit to continue.

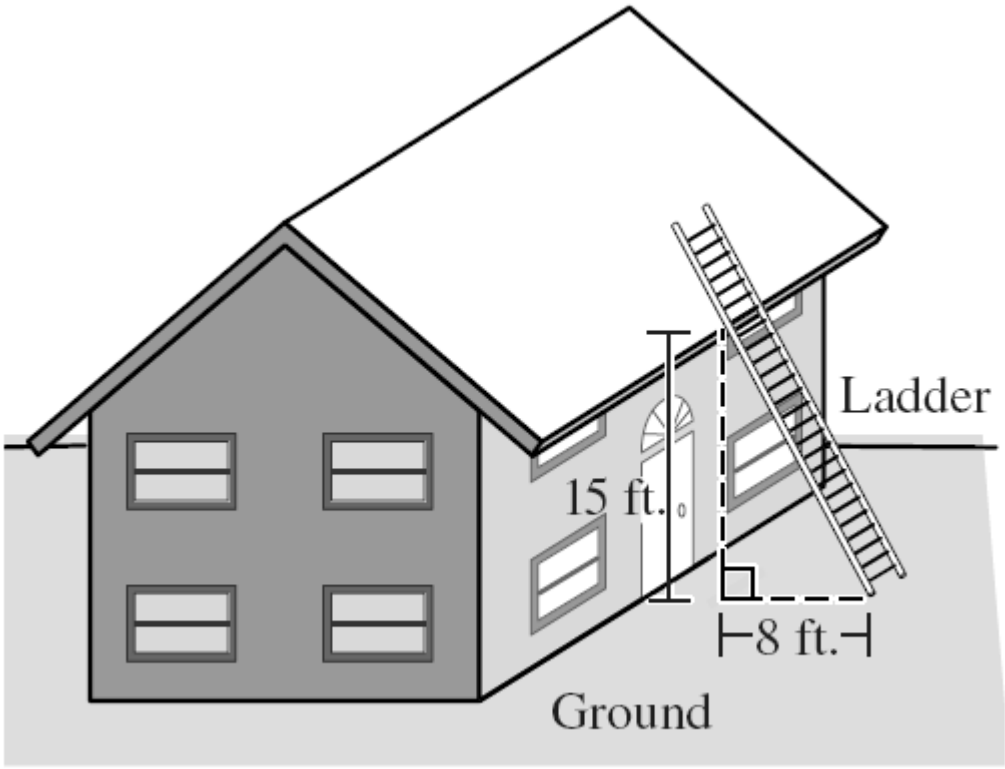
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section

Begin Random Order Section

15.) "2004_33_gr10_calc" (Problem ID: 12656) RADIO_BUTTON **[MA - 2004 - Spring - 33]**

No knowledge components have been assigned



Using the measurements shown in the sketch, what is the length of the section of the ladder from the point where it rests on the ground to the point where it touches the house?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 4.8 ft**
✗ **B. 7 ft**
✗ **C. 17 ft**
✓ **D. 23 ft**

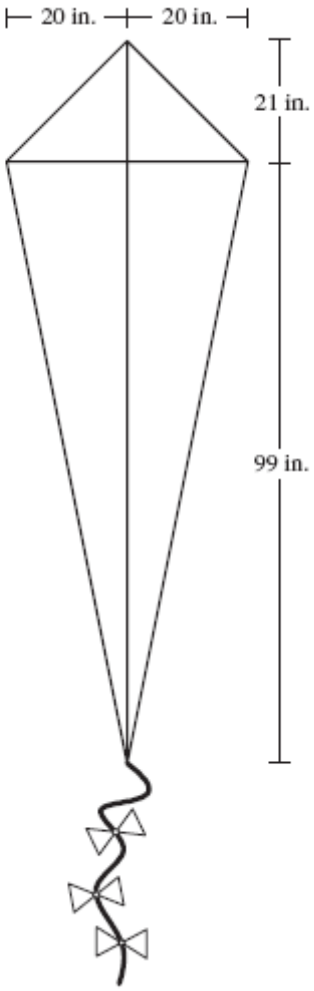
(Problem ID: 12657) RADIO_BUTTON [MA - 2004 - Spring - 33]
The ladder is the hypotenuse of a right triangle formed with the ground and the side of the house.

Which of the following formulas will help us find the length of the ladder? (x is the length of the ladder)

(Problem ID: 12658) RADIO_BUTTON [MA - 2004 - Spring - 33]
Using the equation we found above, find x, the length of the ladder.

16.) "2005_32_gr10_calc" (Problem ID: 13158) ALGEBRA_FIELD [MA - 2005 - Spring - 32]

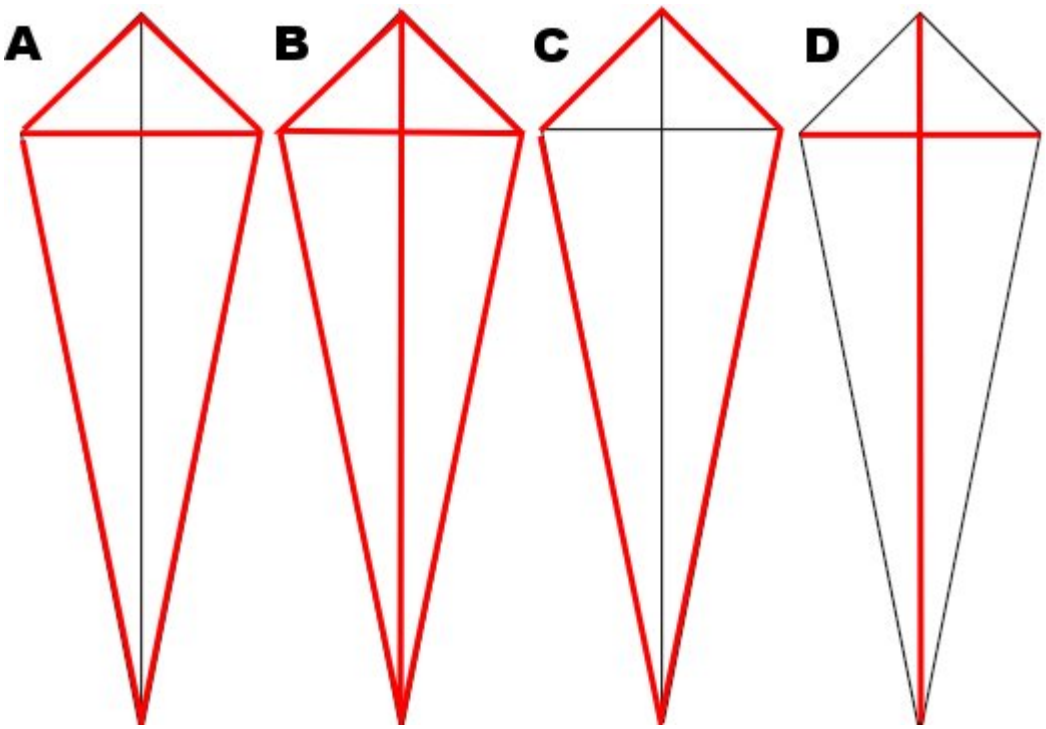
No knowledge components have been assigned



A kite has perpendicular diagonals with the measures shown in the drawing above.

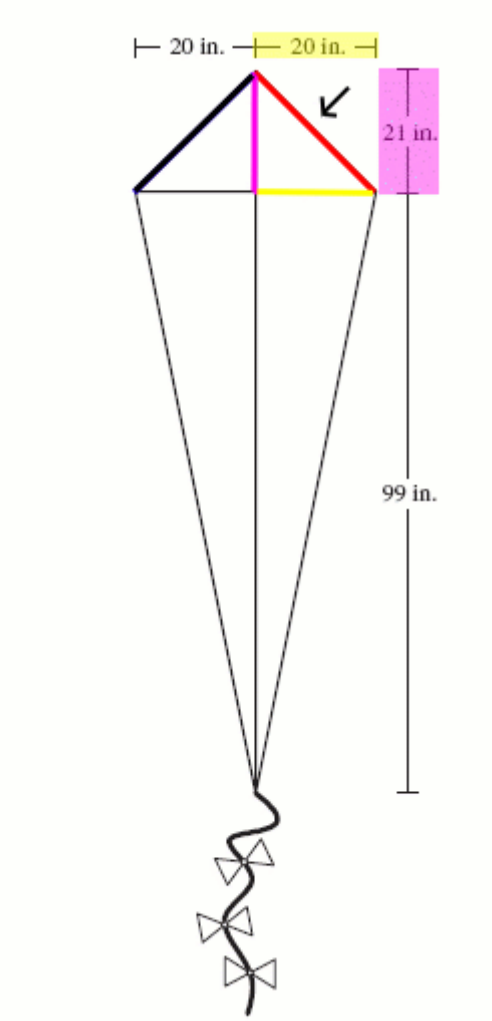
What is the perimeter, in inches of the kite?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **260**

(Problem ID: 13159) RADIO_BUTTON [MA - 2005 - Spring - 32]



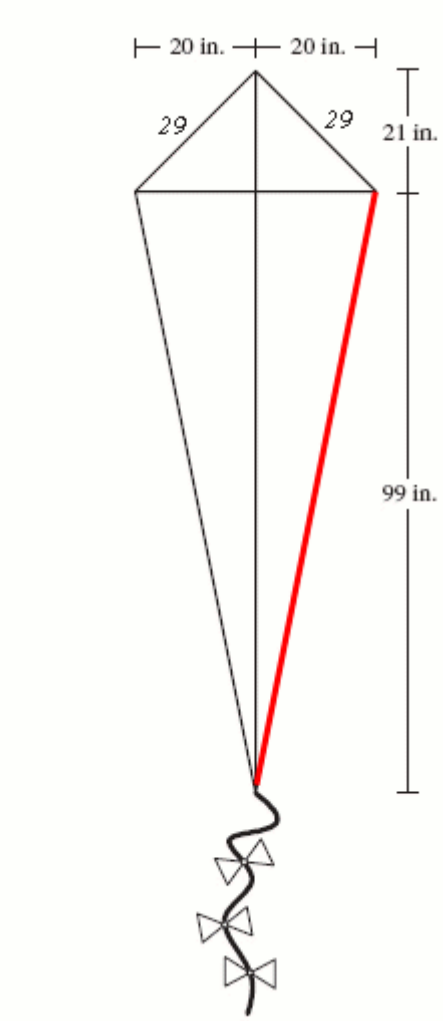
Let's start by making sure you understand what the perimeter is. In which of the above kites is the red portion the perimeter?

(Problem ID: 13610) TEXT_FIELD [MA - 2005 - Spring - 32]



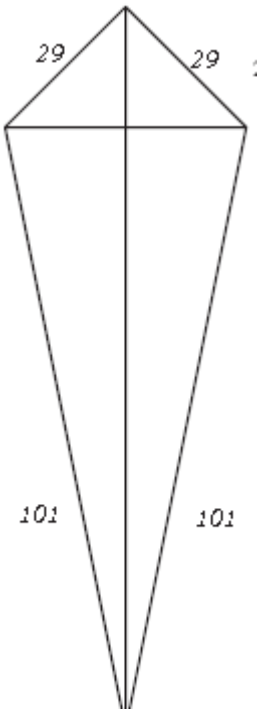
Now let's actually find the lengths of the line segments of the perimeter. Start with the line segment shaded in red.

(Problem ID: 13611) TEXT_FIELD [MA - 2005 - Spring - 32]



Now we know two lengths in the perimeter. Let's find the others. In order to find the length of the new line segment shaded in red, follow the same procedure from the previous problem. What is the length of the red segment?

(Problem ID: 13615) TEXT_FIELD [MA - 2005 - Spring - 32]

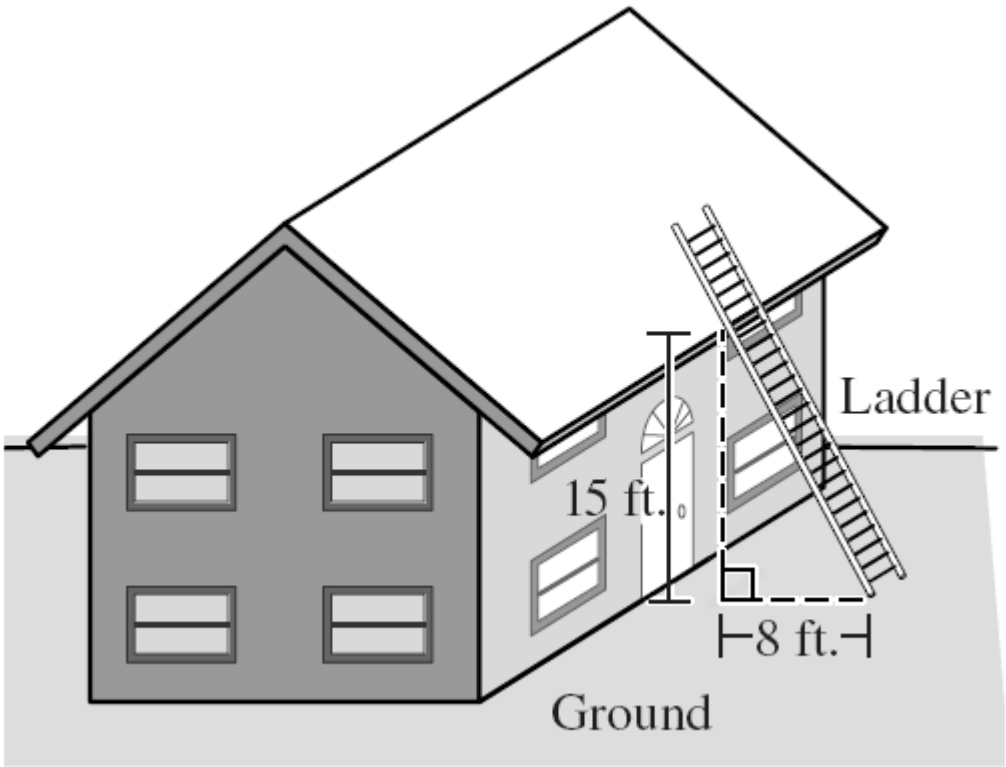


Now add up the values of the edges of the kite. What is the perimeter?

End Random Order Section Begin Random Order Section

17.) "2004_33_gr10_calc_HINT" (Problem ID: 15492) RADIO_BUTTON [MA - 2004 - Spring - 33]

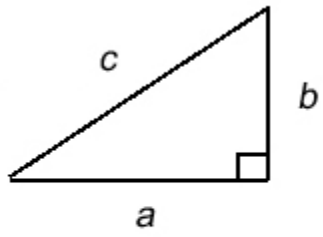
No knowledge components have been assigned



Using the measurements shown in the sketch, what is the length of the section of the ladder from the point where it rests on the ground to the point where it touches the house?
Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 4.8 ft**
✗ **B. 7 ft**
✓ **C. 17 ft**
✗ **D. 23 ft**

Hint 1:



$a^2 + b^2 = c^2$

The section of the ladder from the point where it rests on the ground to the point where it touches the house makes up the hypotenuse of a right triangle.

Use the Pythagorean Theorem to setup an equation to solve for the distance of the hypotenuse. Refer to your reference sheet to find the Pythagorean Theorem or look at the image above.
Hint 2:
By substituting in our values:

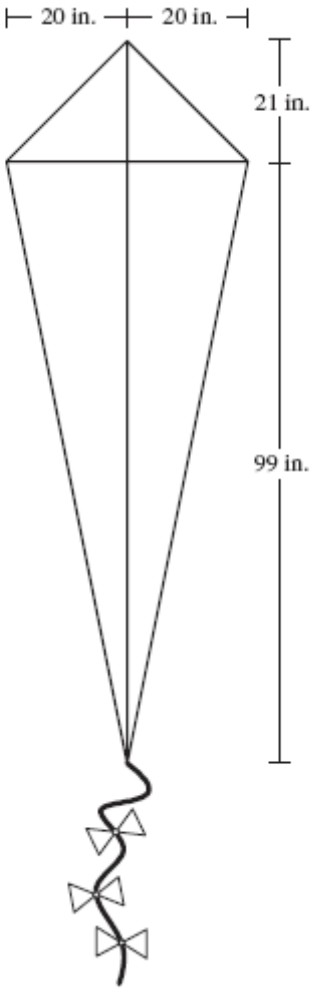
$8^2 + 15^2 = x^2$

Simplify and solve for x.
Hint 3:
Evaluate the exponents first.

$64 + 225 = x^2$ $289 = x^2$
Hint 4:
The square root of 289 is 17. The answer is 17 ft.

18.) "2005_32_gr10_calc_HINT" (Problem ID: 15495) ALGEBRA_FIELD [MA - 2005 - Spring - 32]

No knowledge components have been assigned



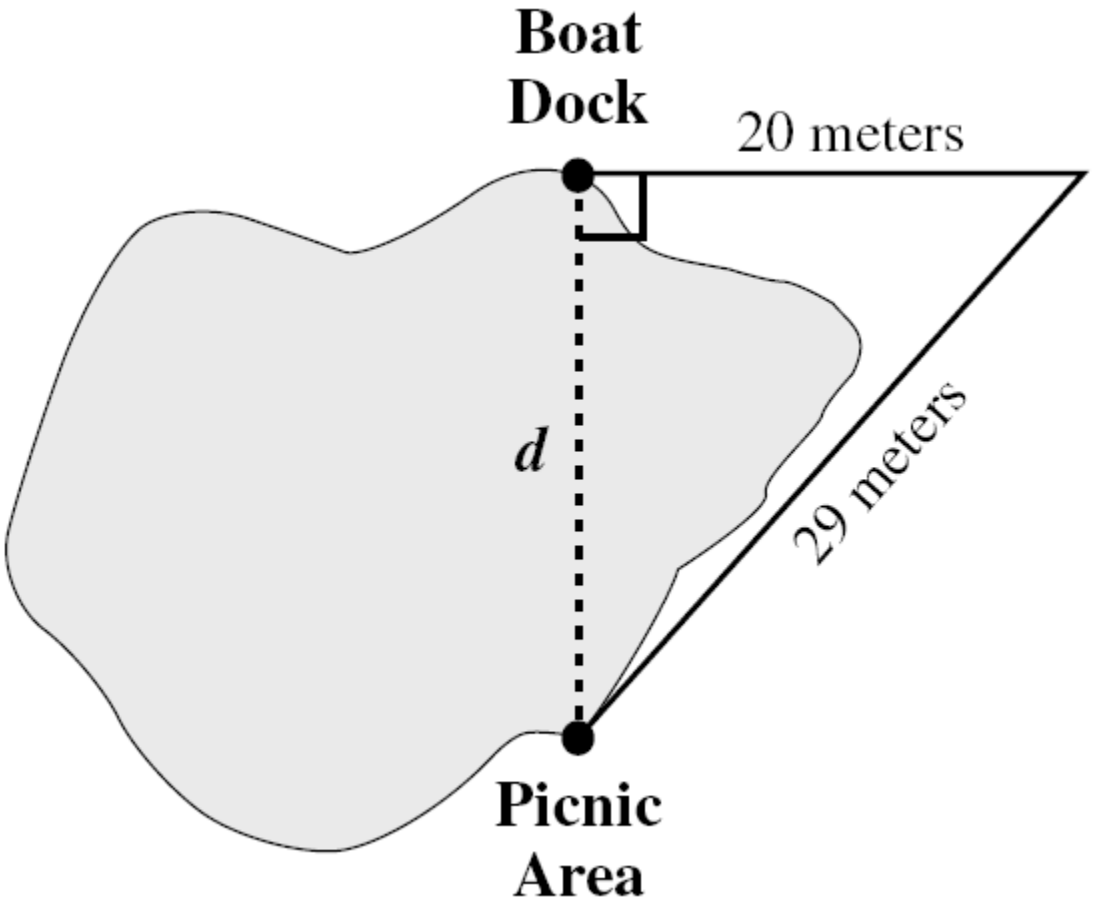
A kite has perpendicular diagonals with the measures shown in the drawing above.

What is the perimeter, in inches of the kite?
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **260**

End Random Order Section
End '{Problem}' Section Begin Random Order Section

19.) "2005Nov_25_gr10_calc" (Problem ID: 13659) RADIO_BUTTON [MA - 2005 - NOV - 25]

No knowledge components have been assigned



Malik used the measurements shown in the diagram above to find the distance across a pond between a boat dock and a picnic area.

What is d, the distance between these two points?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 18 meters**
✓ **B. 21 meters**
✗ **C. 25 meters**
✗ **D. 49 meters**

(Problem ID: 13660) RADIO_BUTTON [MA - 2005 - NOV - 25]

No knowledge components have been assigned
The triangle shown is a right triangle, we should know of a relationship between two legs and the hypotenuse. Which of the following represents this?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13661) RADIO_BUTTON [MA - 2005 - NOV - 25]

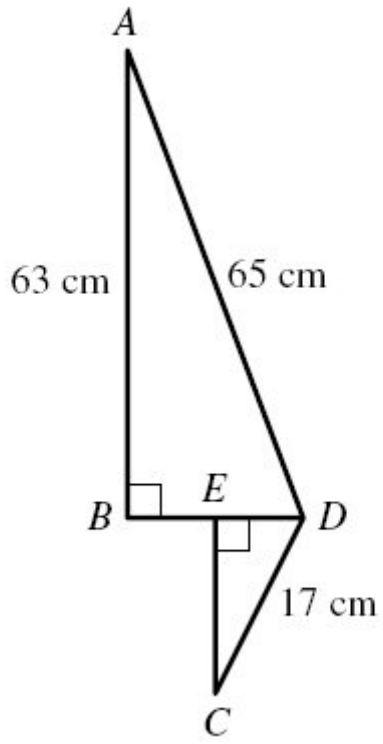
No knowledge components have been assigned
So now, let's solve for d. This will be the answer.

We have the formula $20^2 + d^2 = 29^2$

What is d?
Answers: (Interface Type: RADIO_BUTTON)

20.) "2005m_33_gr10_calc" (Problem ID: 14088) RADIO_BUTTON [MA - 2005 - MAR - 33]

No knowledge components have been assigned



In the figure above, E is the midpoint of BD.

What is the length of CE?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 5.7 cm**
✗ **B. 8 cm**
✓ **C. 15 cm**
✗ **D. 18.8 cm**

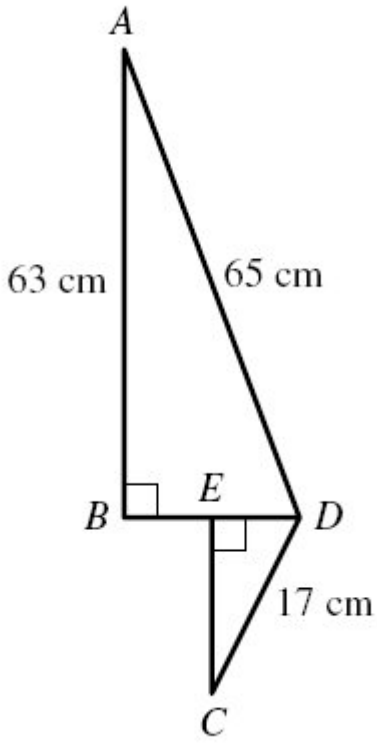
(Problem ID: 14089) TEXT_FIELD [MA - 2005 - MAR - 33]

No knowledge components have been assigned

To find the measure of CE, we will need to find the measure of ED. To do that, we first need to find the measure of BD. Find BD.
Answers: (Interface Type: TEXT_FIELD)

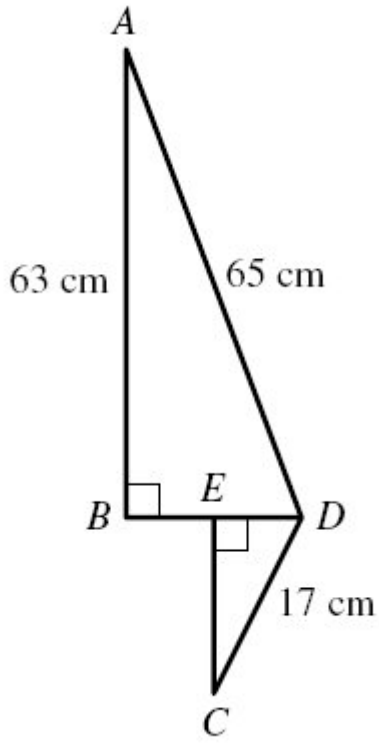
(Problem ID: 14090) TEXT_FIELD [MA - 2005 - MAR - 33]

No knowledge components have been assigned



E is a midpoint of BD. We found that BD was 16. What is the measure of ED?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 14091) RADIO_BUTTON [MA - 2005 - MAR - 33]
No knowledge components have been assigned

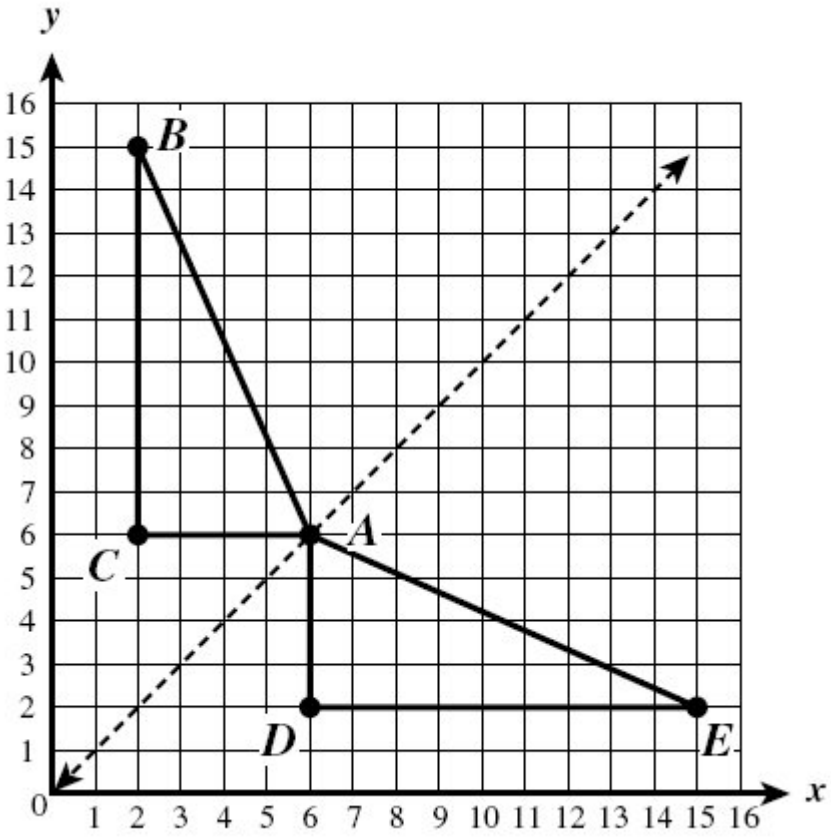


And now we can return to the original problem. Find the measure of CE.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

21.) "pre_2005n_2_gr10_nocalc" (Problem ID: 21665) RADIO_BUTTON

No knowledge components have been assigned



Right triangles ABC and AED are shown on the coordinate grid below. Which single transformation, with respect to the line y = x, maps ABC to AED?

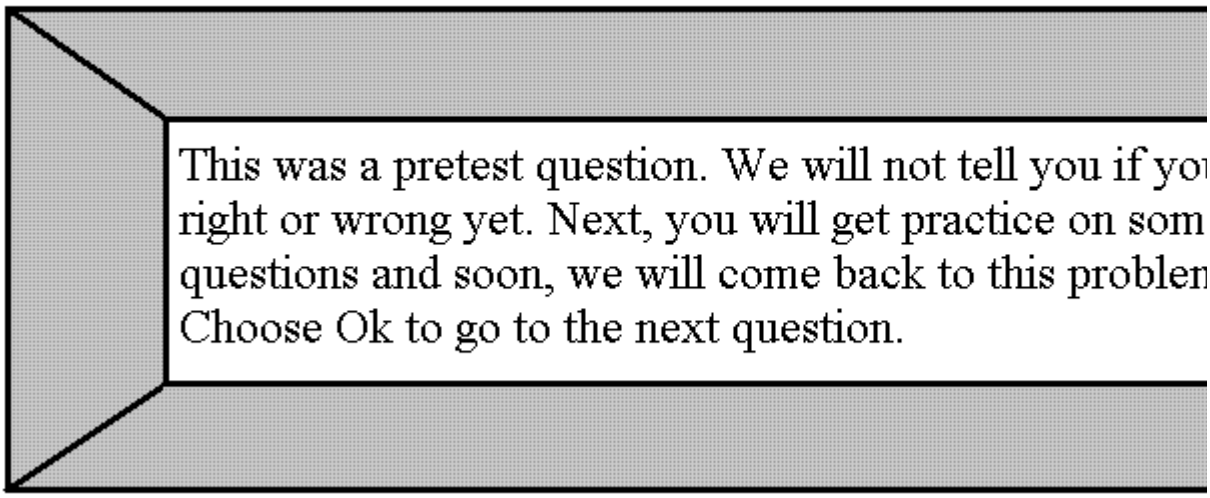
Answers: (Interface Type: RADIO_BUTTON)

- ✗ **A. dilation**
- ✓ **B. reflection**
- ✗ **C. rotation**
- ✗ **D. translation**

(Problem ID: 21760) RADIO_BUTTON

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

22.) "pre_2001_8_10_geo_s" (Problem ID: 21780) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

As the result of a transformation, the image of the point (-1,3) is (-3,1). This is an example of a reflection across the

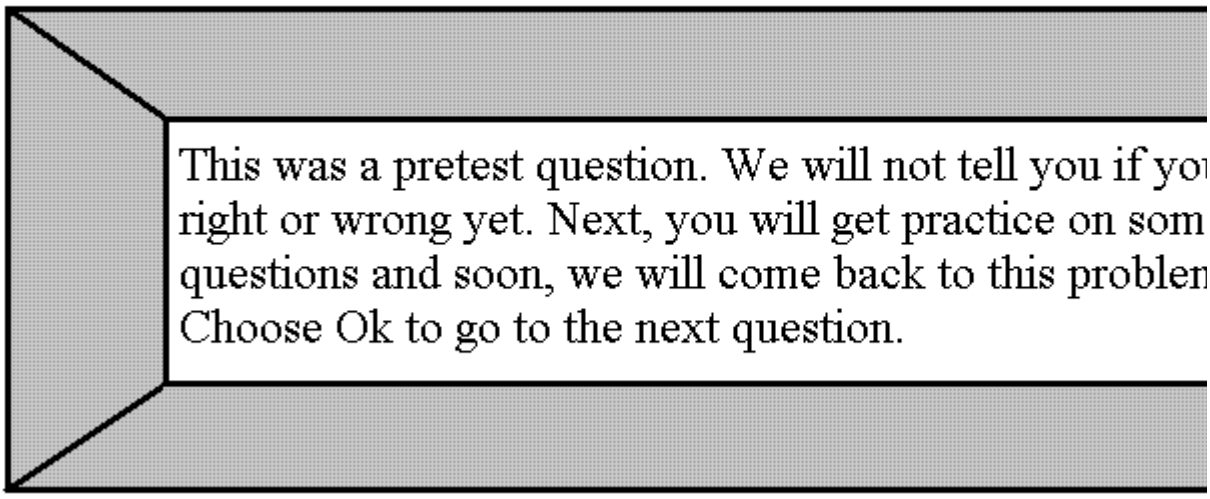
Answers: (Interface Type: RADIO_BUTTON)

- ✗ **A. line y = x**
- ✓ **B. line y = -x**
- ✗ **C. x-axis**
- ✗ **D. y-axis**

(Problem ID: 21781) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

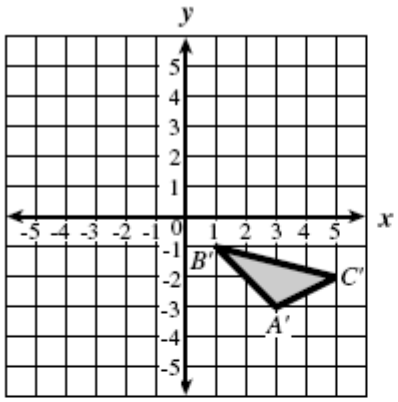
We will come back to this problem later. Choose Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

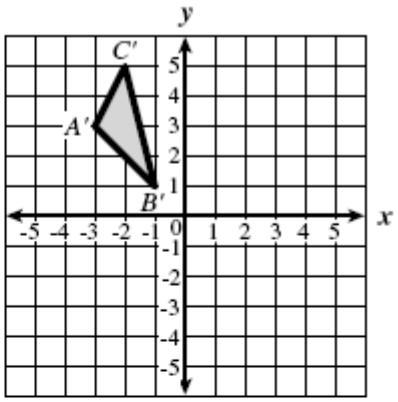
23.) "2005Nov_26_gr10_calc" (Problem ID: 13644) RADIO_BUTTON [MA - 2005 - NOV - 26]

No knowledge components have been assigned

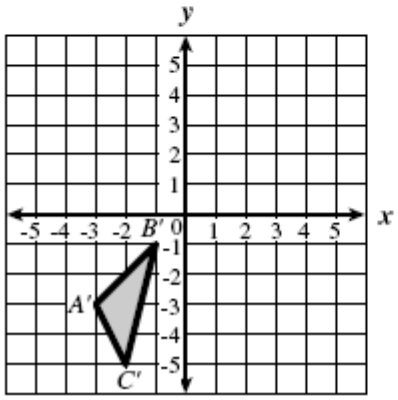
A.



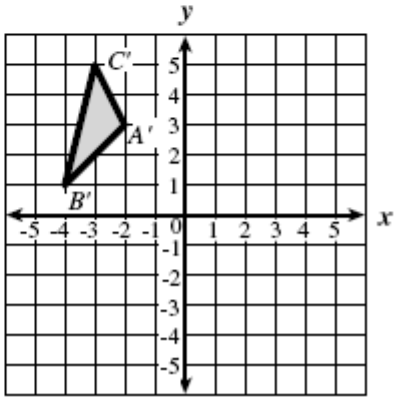
C.



B.



D.

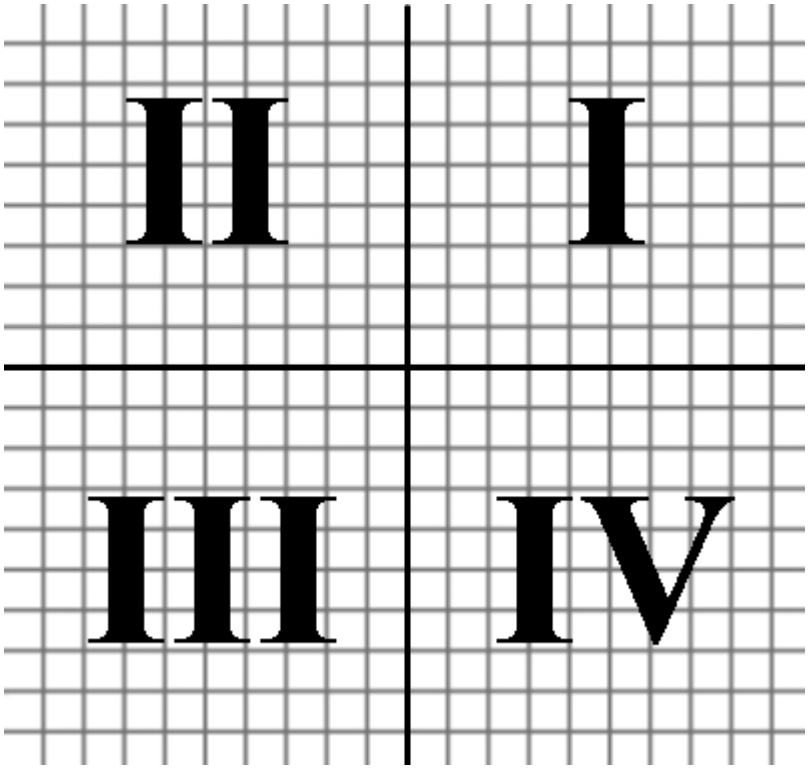


Triangle ABC has vertices at A(3,3), B(1,1), and C(2,5). In which of the graphs below is triangle A'B'C', a reflection of a triangle ABC over the y-axis?

Answers: (Interface Type: RADIO_BUTTON)

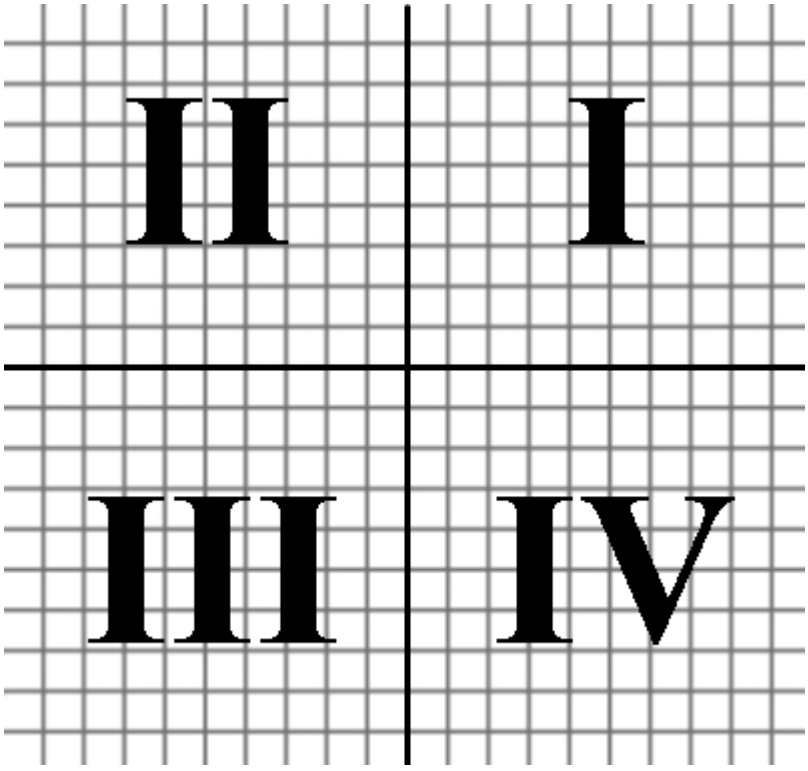
✗ **A**
✗ **B**
✓ **C**
✗ **D**

(Problem ID: 13695) RADIO_BUTTON [MA - 2005 - NOV - 26]



If you are having trouble with this problem, it always helps to draw a picture. Make a sketch of triangle ABC. In which quadrant is triangle ABC located?

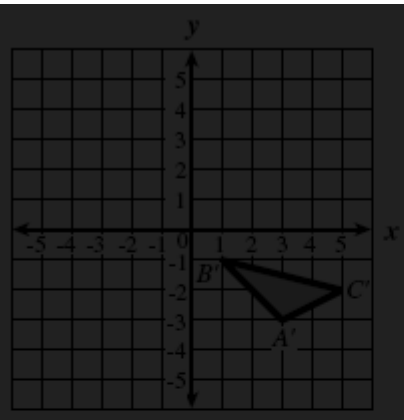
(Problem ID: 13646) RADIO_BUTTON **[MA - 2005 - NOV - 26]**



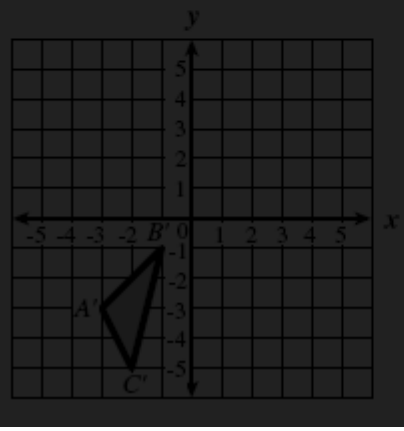
If we reflect the triangle in Quadrant I across the y-axis, which quadrant should the reflection (triangle A'B'C') be in?

(Problem ID: 13647) RADIO_BUTTON [MA - 2005 - NOV - 26]

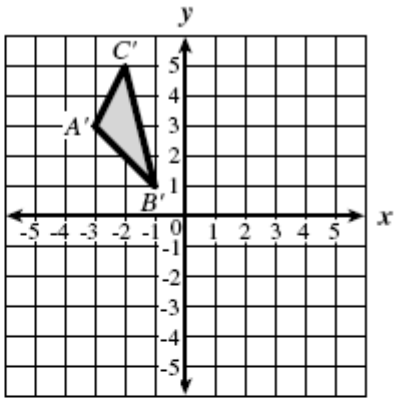
A.



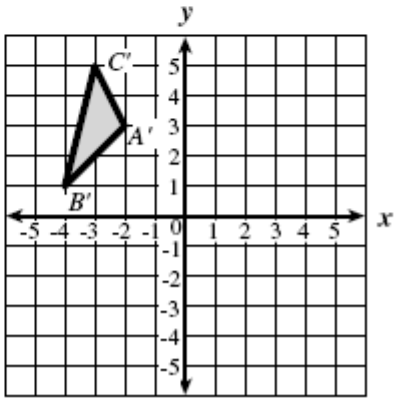
B.



C.



D.

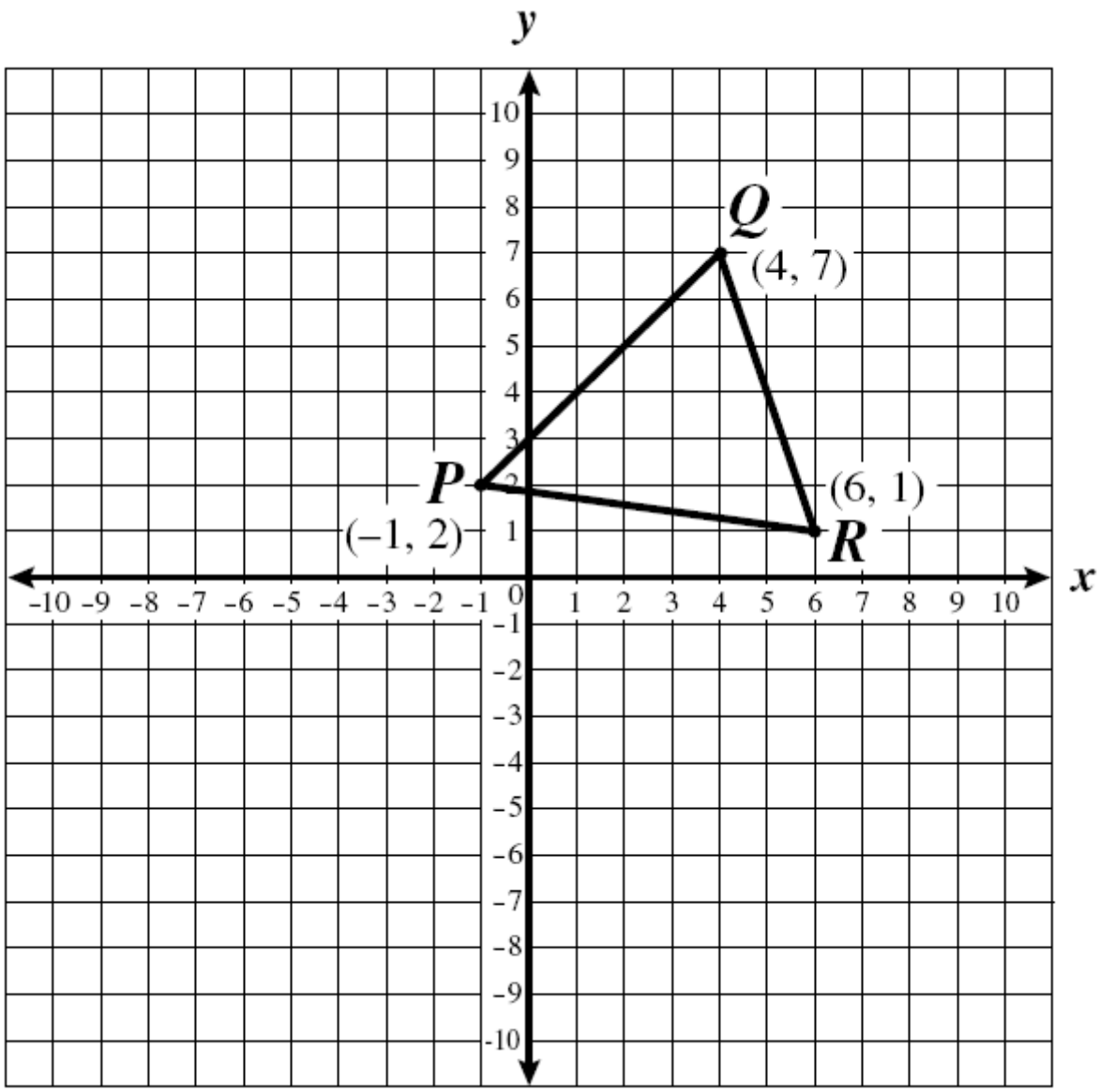


We can now rule out choices A and B because they are in Quadrants III and IV respectively. Which of the remaining choices will be triangle A'B'C', the reflection of triangle ABC across the y axis?

(Remember: Triangle ABC has vertices at A(3,3), B(1,1), and C(2,5))

24.) "2005Nov_18_gr10_nocalc" (Problem ID: 13676) RADIO_BUTTON [MA - 2005 - Spring - 18]

No knowledge components have been assigned



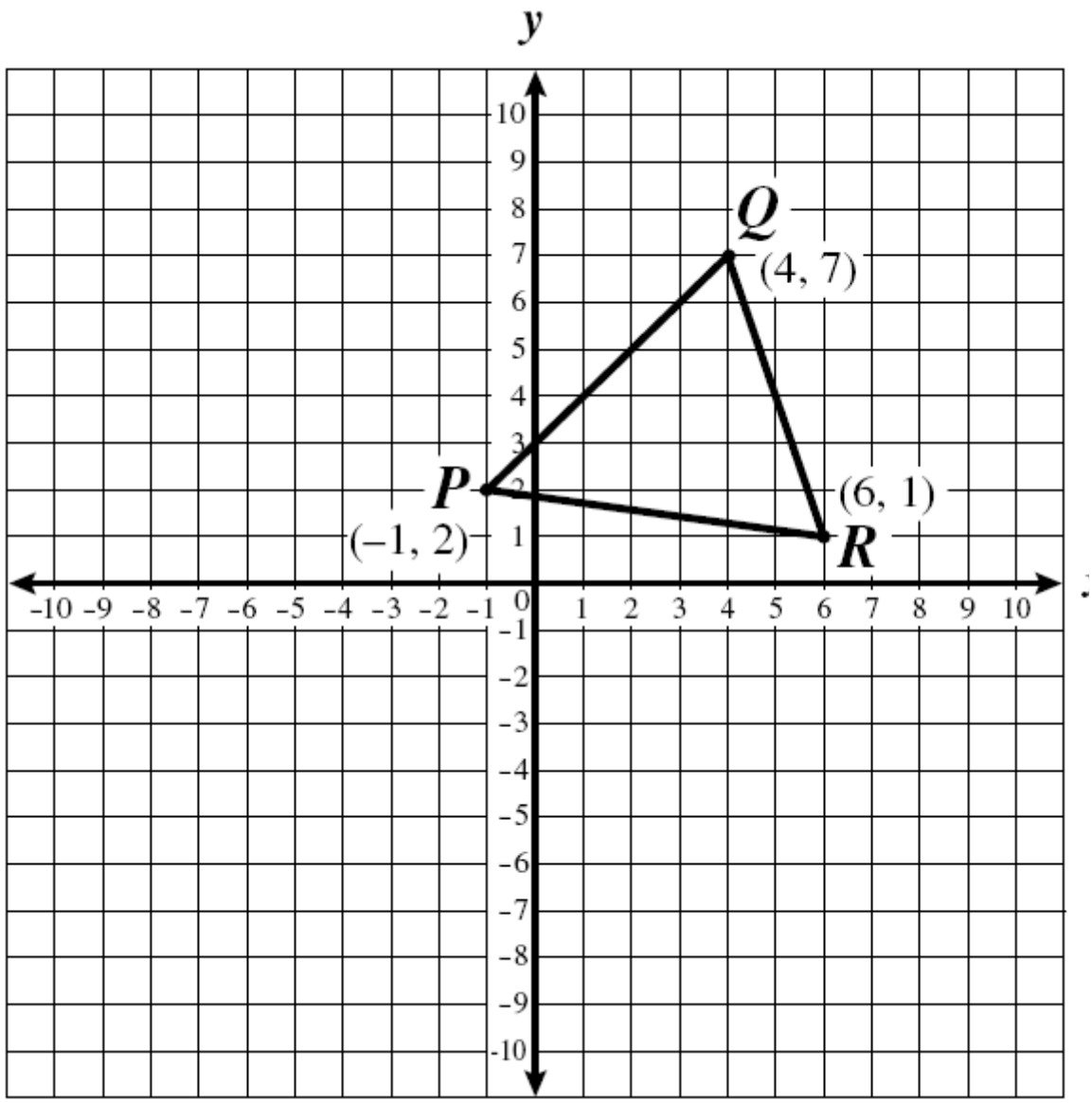
Sydney accurately sketched triangle P'Q'R', the reflection of triangle PQR across the x-axis. What are the coordinates of point Q' in triangle P'Q'R'?

Answers: (Interface Type: RADIO_BUTTON)

✗ **D. (16, 49)**
✗ **A. (-4, -7)**
✓ **B. (4, -7)**
✗ **C. (-4, 7)**

(Problem ID: 13677) RADIO_BUTTON [MA - 2005 - Spring - 18]
If a point is at (x,y), where will it be after a reflection across the x-axis?

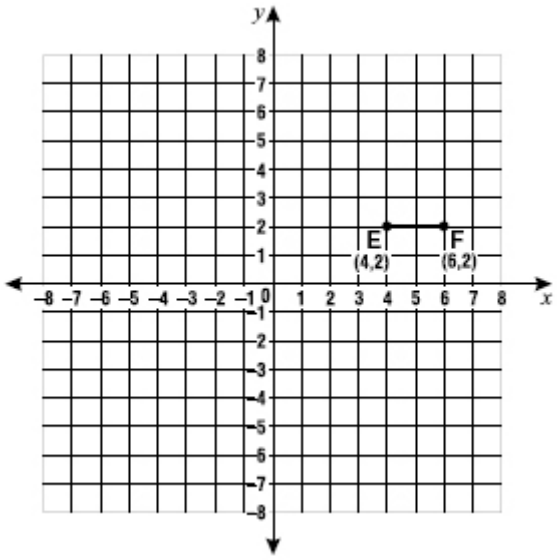
(Problem ID: 13678) RADIO_BUTTON [MA - 2005 - Spring - 18]



So if a point (x,y) is reflected across the x-axis is (x,-y), what is the coordinate of point Q' from the triangle P'Q'R', the reflection of triangle PQR across the x-axis?

25.) "2003_33_10_s (2006/08/30 21:30:32)" (Problem ID: 12478) RADIO_BUTTON [MA - 2003 - Spring - 33]

No knowledge components have been assigned



The diagram above shows the location of EF on a coordinate plane.Suppose that EF is rotated 180 degrees clockwise about the origin. What are the coordinates of the image of point E?

Answers: (Interface Type: RADIO_BUTTON)

✗ **(-2, -4)**
✓ **(-4, -2)**
✗ **(4, -2)**
✗ **(-4, 2)**

(Problem ID: 12479) RADIO_BUTTON [MA - 2003 - Spring - 33]

A 180 degree rotation of an image around the origin can be found by doing a reflection across both the x-axis and the y-axis. What are the coordinates of the image of point E after reflecting across the x-axis?

(Problem ID: 12480) RADIO_BUTTON [MA - 2003 - Spring - 33]

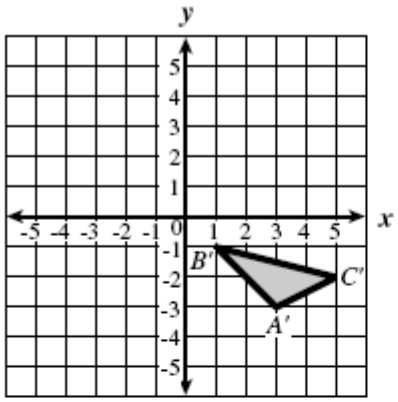
Starting from after the reflection across the x-axis, what are the coordinates of the image of point E after reflecting across the y-axis?

End Random Order Section Begin Random Order Section

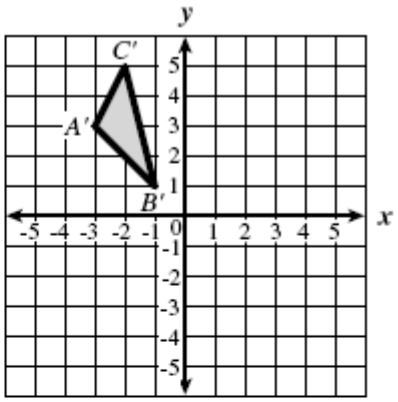
26.) "2005Nov_26_gr10_calc_HINT" (Problem ID: 15500) RADIO_BUTTON [MA - 2005 - NOV - 26]

No knowledge components have been assigned

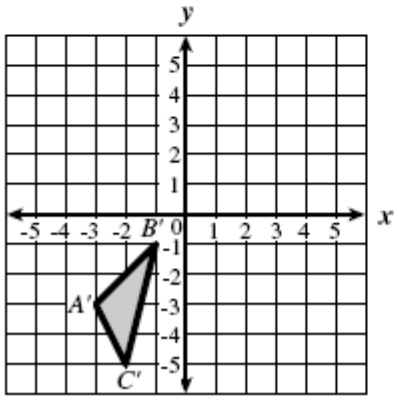
A.



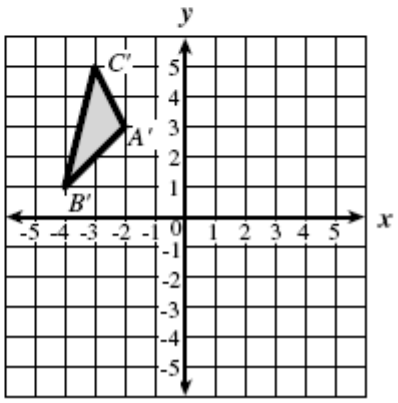
C.



B.



D.

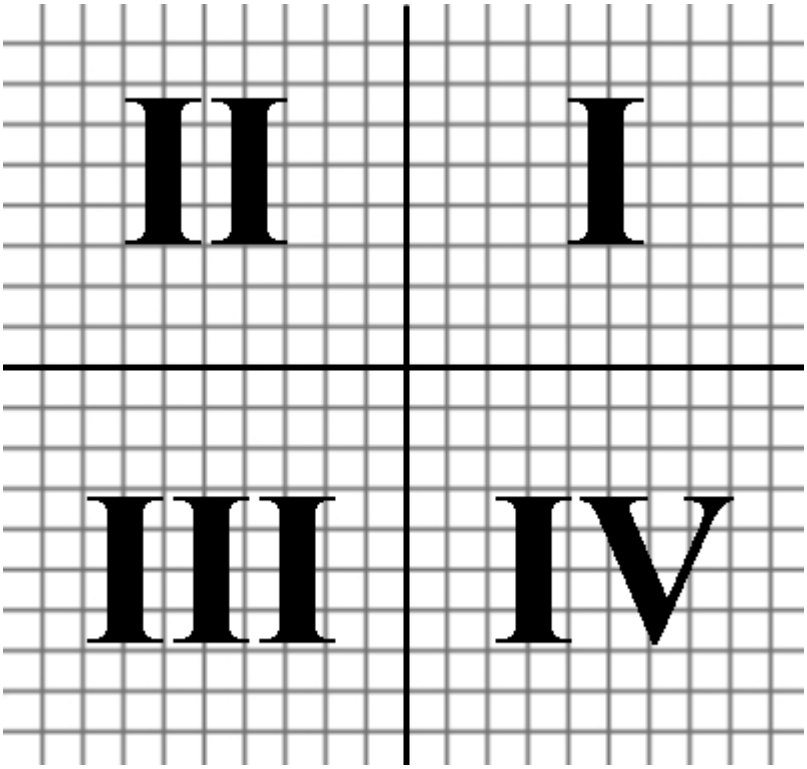


Triangle ABC has vertices at A(3,3), B(1,1), and C(2,5). In which of the graphs below is triangle A'B'C', a reflection of a triangle ABC over the y-axis?

Answers: (Interface Type: RADIO_BUTTON)

✗ **A**
✗ **B**
✓ **C**
✗ **D**

Hint 1:



To figure out which answer choice represents A'B'C', let's first consider which quadrant ABC should be in.

Hint 2:

ABC, which has all positive coordinates should be in quadrant I. Which quadrant should A'B'C', the reflection of ABC across the y-axis, be in?

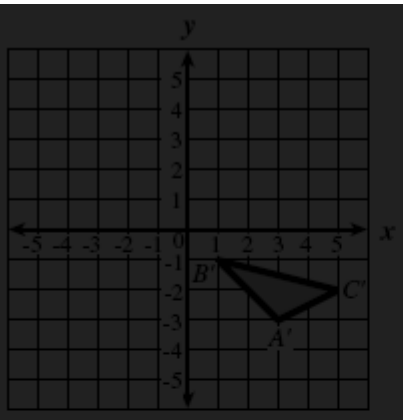
Hint 3:

One way to think about a reflection across the y axis is:

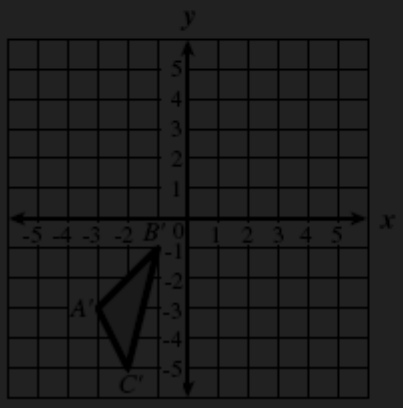
If the x-y graph was a piece of paper and we folded it with the y-axis being the crease. Which quadrant would touch Quadrant I?

Hint 4:

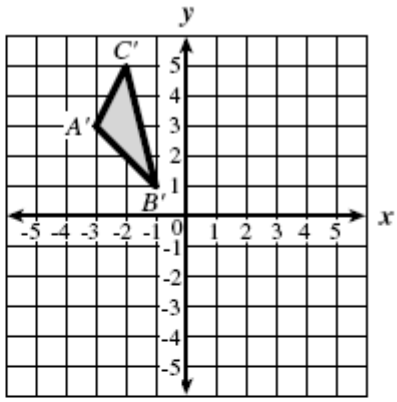
A.



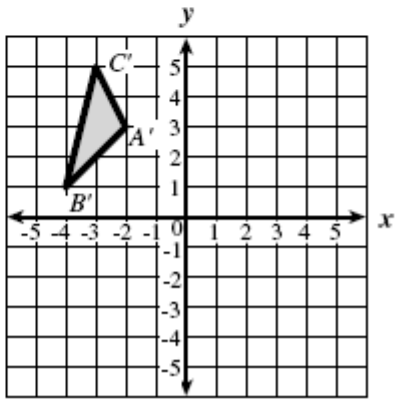
B.



C.



D.



Quadrant II and Quadrant I should touch if the graph is folded across the y-axis.

A'B'C' should be in Quadrant II. This rules out two of our answer choices.
Hint 5:
Use graph or scrap paper and plot the points of ABC on the x-y plane.

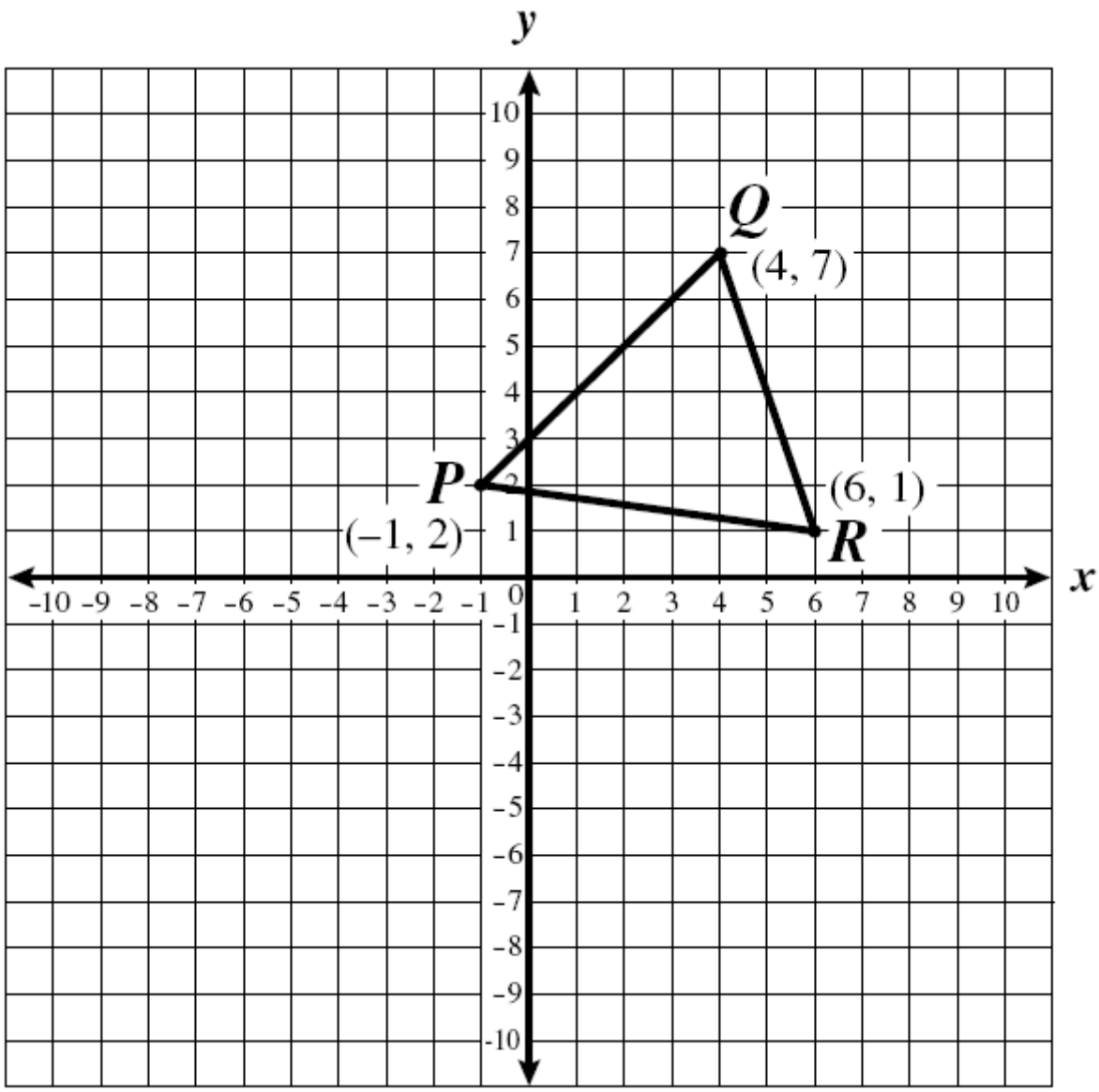
Consider each of the two possible choices. If you fold the paper with the crease being the y-axis, the triangles should line up perfectly.

Alternatively, ABC and A'B'C' should be symmetrical with respect to the y-axis.
Hint 6:
C fits the requirements. A'B'C' here is symmetrical with respect to ABC.

The answer is C.

27.) "2005Nov_18_gr10_nocalc_HINT" (Problem ID: 15504) RADIO_BUTTON [MA - 2005 - Spring - 18]

No knowledge components have been assigned



Sydney accurately sketched triangle P'Q'R', the reflection of triangle PQR across the x-axis. What are the coordinates of point Q' in triangle P'Q'R'?

Answers: (Interface Type: RADIO_BUTTON)

✗ **D. (16, 49)**

✗ **A. (-4, -7)**

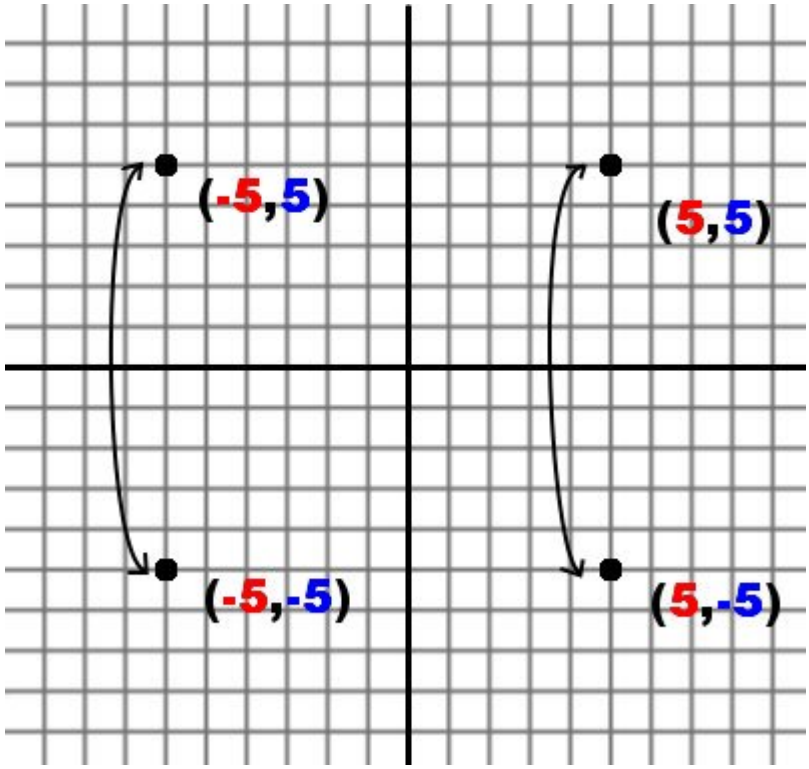
✓ **B. (4, -7)**

✗ **C. (-4, 7)**

Hint 1:

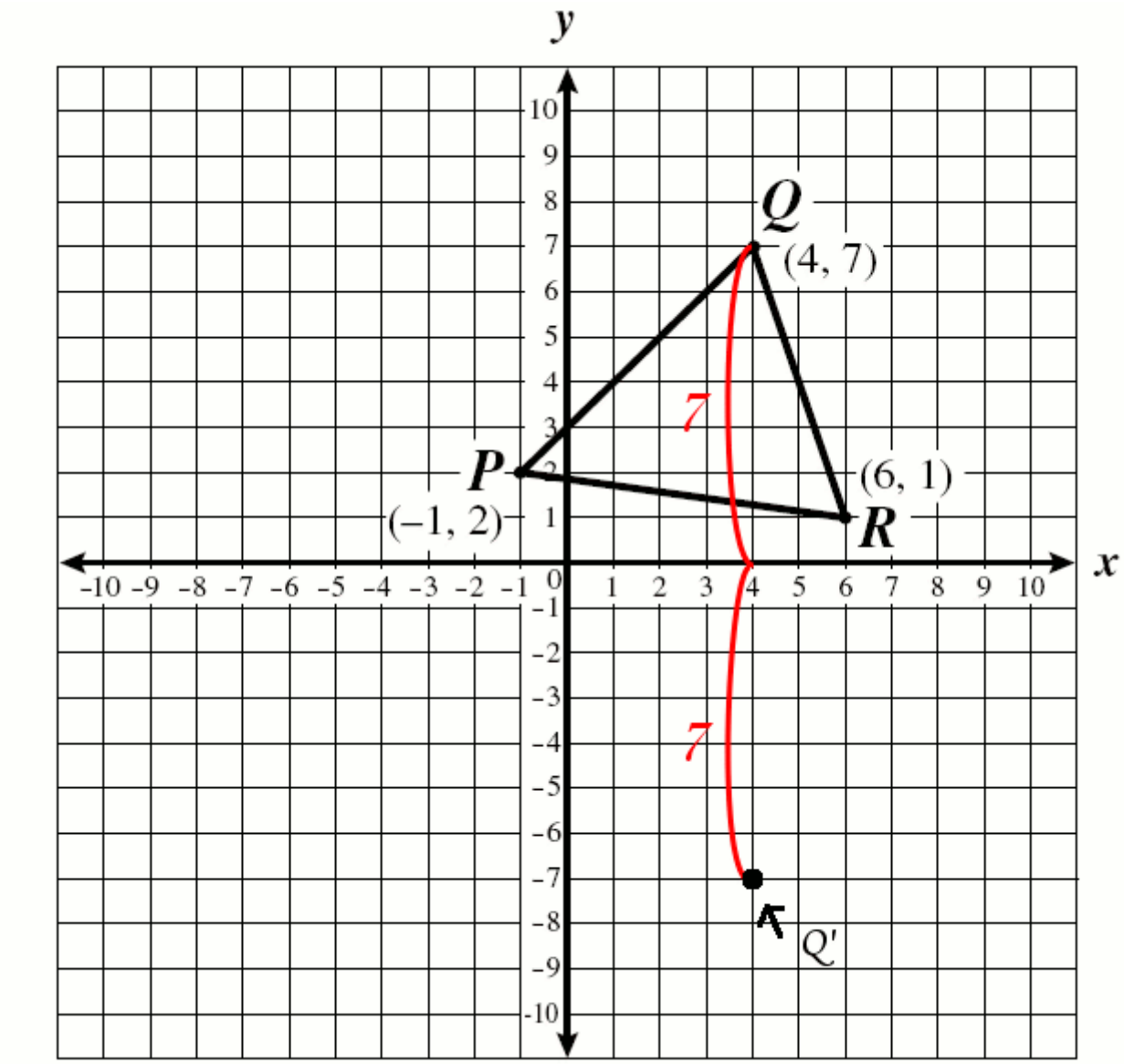
In order to find the point Q', we will need to figure out what happens to Q when it is reflected across the x-axis.

Hint 2:



Points reflected across the x-axis have their x-coordinate unchanged, but the y-coordinate is changed. In the y-direction, the distance from the point to the x-axis will be the same as its reflected point on the other side of the x-axis.

(Note: the x coordinate will stay the same (in red), but the y-coordinate changes)
Hint 3:



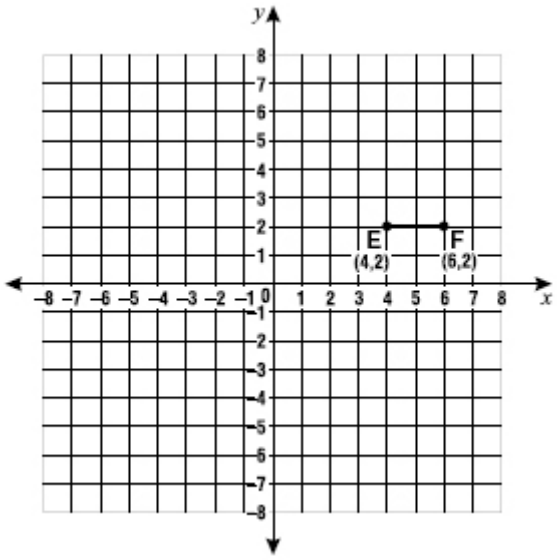
For Q, we notice the distance to the x-axis from Q is 7. So this must be true of Q'. We also know that the x-coordinate must stay the same.

Use the image above to find the coordinate of Q'
Hint 4:
Q' is at the coordinate (4, -7)

Please select answer choice B.

28.) "2003.33.10.h" (Problem ID: 15432) RADIO_BUTTON [MA - 2003 - Spring - 33]

No knowledge components have been assigned



The diagram above shows the location of EF on a coordinate plane.Suppose that EF is rotated 180 degrees clockwise about the origin. What are the coordinates of the image of point E?

Answers: (Interface Type: RADIO_BUTTON)

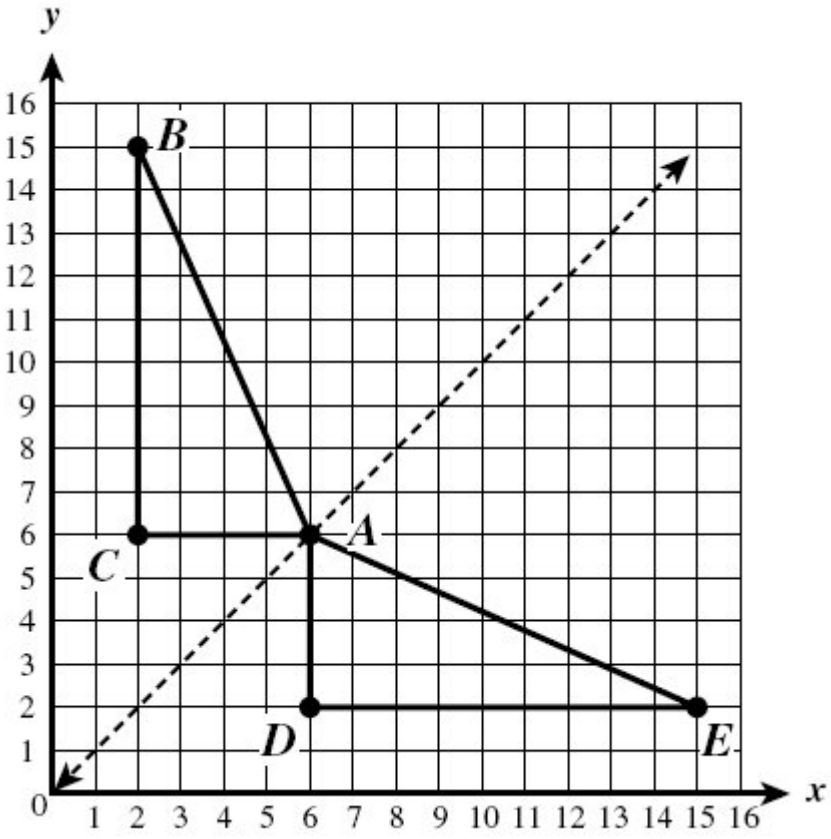
✗ **(-2, -4)**
✓ **(-4, -2)**
✗ **(4, -2)**
✗ **(-4, 2)**

Hint 1:
A 180 degree rotation of an image around the origin can be found by doing a reflection across both the x-axis and the y-axis.
Hint 2:
In order to reflect a coordinate across the x-axis, multiply the y-coordinate by -1.
Hint 3:
In order to reflect a coordinate across the y-axis, multiply the x-coordinate by -1.
Hint 4:
To do a 180 degree rotation of an image around the origin, reflect the coordinate across the x-axis and the y-axis. To do this, you need to multiply both the x and y coordinates by -1.
Hint 5:
When you multiply both the x and y coordinates of the point E (4, 2) by -1, you get the point (-4, -2).
Choose answer choice (-4, -2).

End Random Order Section
End '{Problem}' Section Begin Random Order Section

29.) "2005n_2_gr10_nocalc" (Problem ID: 14102) RADIO_BUTTON

No knowledge components have been assigned



Right triangles ABC and AED are shown on the coordinate grid below. Which single transformation, with respect to the line y = x, maps ABC to AED?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. dilation ***Dilations are changes in size and are not done with respect to a line.***

✓ B. reflection

✗ C. rotation ***Rotations on the xy plane are done with respect to a point, not a line.***

✗ D. translation ***Translations are shifts up and down and to the left and right. They are not with respect to a line.***

Hint 1:
In the xy-plane, only one of the transformations listed is done with respect to a line.

Hint 2:
A reflection is done with respect to a line. Here, the triangles make a reflection across the y = x line.

Hint 3:
The answer is reflection. Choose answer choice B

30.) "2001.8.10.geo.s" (Problem ID: 14857) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

As the result of a transformation, the image of the point (-1,3) is (-3,1). This is an example of a reflection across the

Answers: (Interface Type: RADIO_BUTTON)

✗ A. line y = x

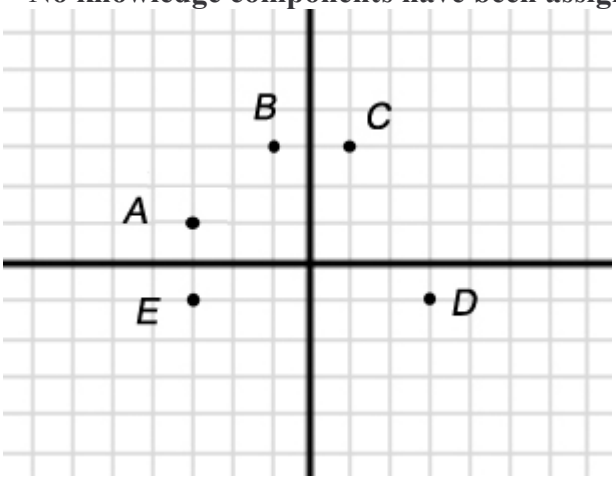
✓ B. line y = -x

✗ C. x-axis

✗ D. y-axis

(Problem ID: 14858) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

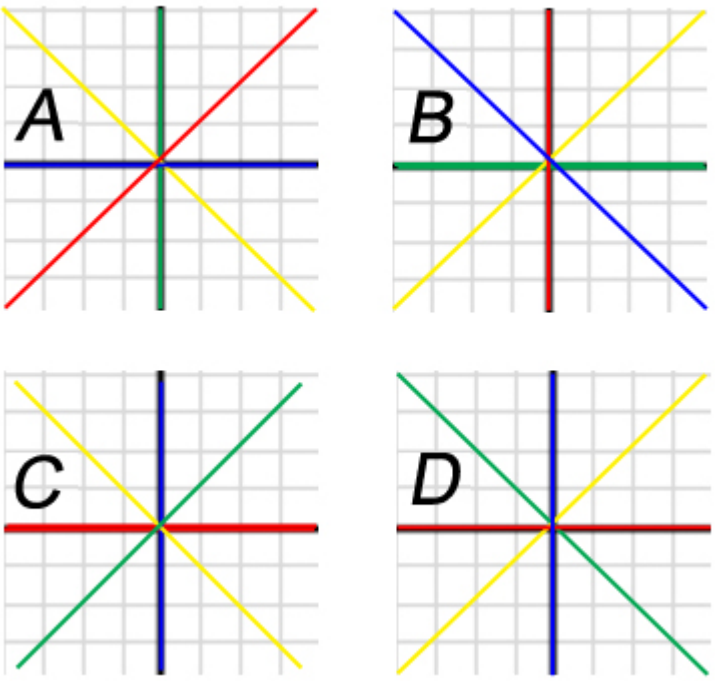


This is the type of problem where a sketch will help. Start by plotting the points!

Which pair of points in the image above are the two points given in the question?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14859) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned



Which of the above images shows:
line y = x in green

line y = -x in yellow
x-axis in red
y-axis in blue?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14860) RADIO_BUTTON [MA - 2001 - SPRING - 8]

No knowledge components have been assigned

Now that we have plotted both of the points and all four of the answer choices, we can decide which line the point (-1, 3) was reflected across to get its image (-3, 1).

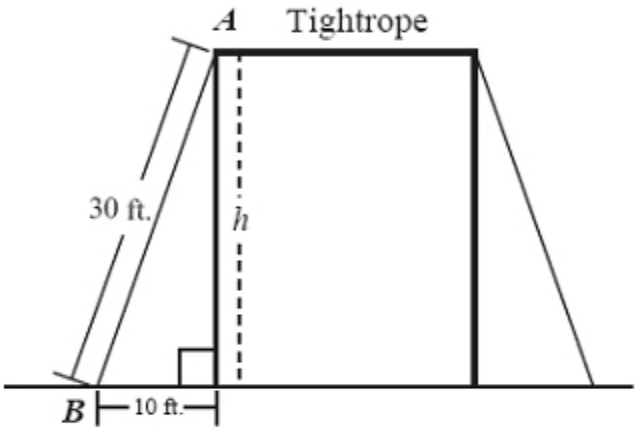
As the result of transformation, the image of the point (-1, 3) is (-3, 1). This is an example of reflection across the:
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

31.) "pre_2002_re_40_10_s" (Problem ID: 21761) RADIO_BUTTON [MA - 2002 - FALL - 40]

No knowledge components have been assigned

In order to stabilize a tightrope at a circus, a wire that has a length of 30 feet is attached from the top of the vertical support at point A to point B on the ground. Point B is 10 feet from the base of the vertical support as shown in the figure below.



Based on this information, which of the following is closest to the value of h, the height of the vertical support?

A. 16 feet

B. 20 feet

C. 28 feet

D. 32 feet

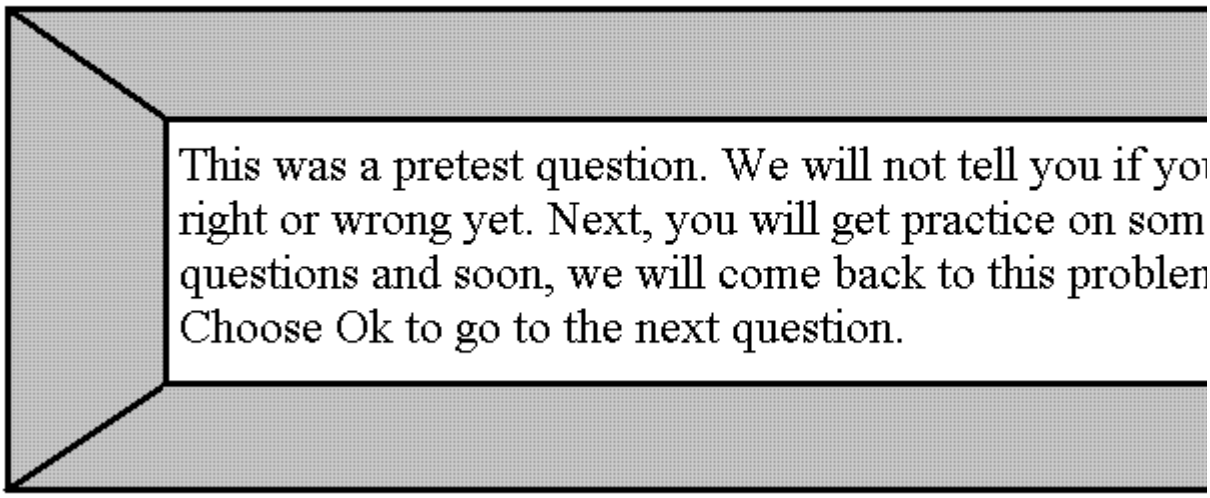
Answers: **(Interface Type: RADIO_BUTTON)**

✗ **A**
✗ **B**
✗ **C**
✗ **D**

(Problem ID: 21762) RADIO_BUTTON [MA - 2002 - FALL - 40]

No knowledge components have been assigned

Pretest Question

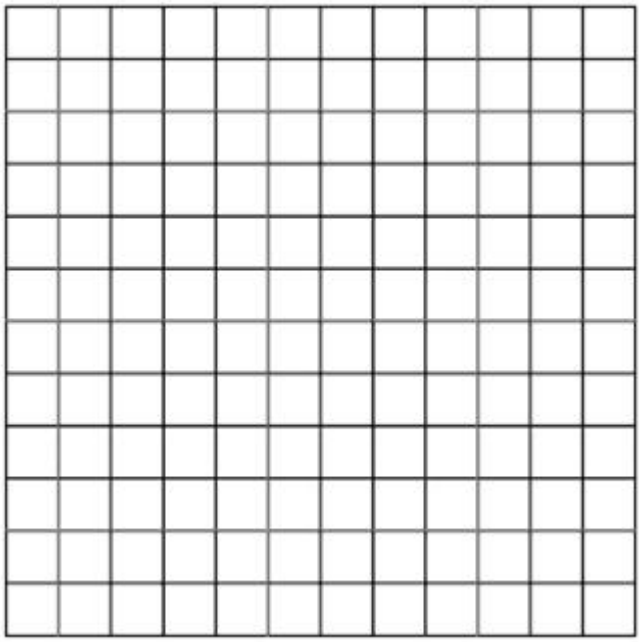


Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

32.) "pre_2003_7_10_s" (Problem ID: 21744) RADIO_BUTTON [MA - 2003 - SPRING - 7]

No knowledge components have been assigned

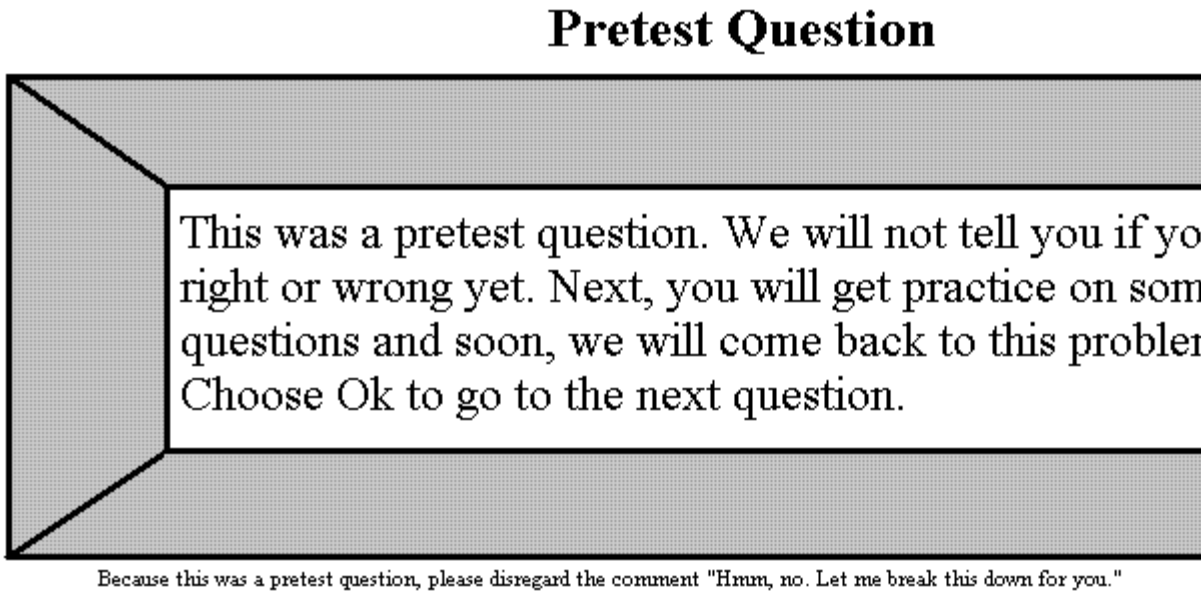


On the coordinate plane, what is the distance between the points (3, 4) and (11, 10)?
Answers: (Interface Type: RADIO_BUTTON)

- ✗ **10**
- ✗ **14**
- ✗ **5**
- ✗ **7**

(Problem ID: 21745) RADIO_BUTTON [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit.

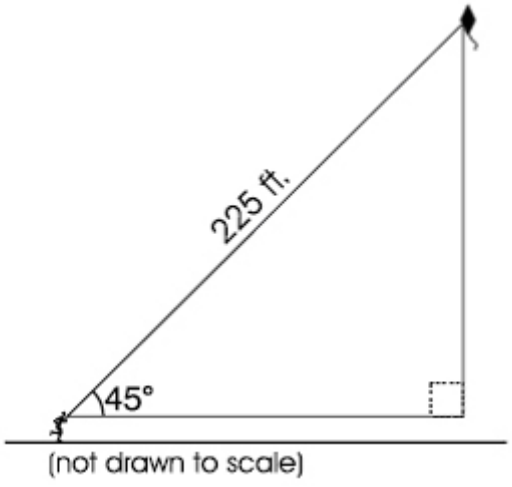
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section

Begin Random Order Section

33.) "2001.17.10.geo.s" (Problem ID: 14861) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned

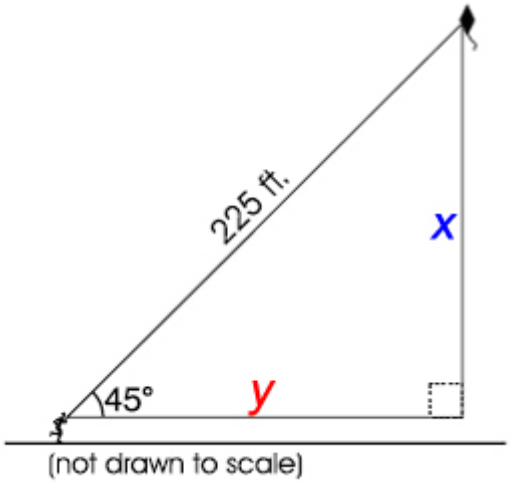


It is believed that the best angle to fly a kite is 45 degrees. If you fly a kite at this angle and let out 225 feet of string, approximately how high above the ground will the kite be?

Answers: (Interface Type: RADIO_BUTTON)

- ✗ **A. 250 feet**
- ✗ **B. 200 feet**
- ✓ **C. 150 feet**
- ✗ **D. 100 feet**

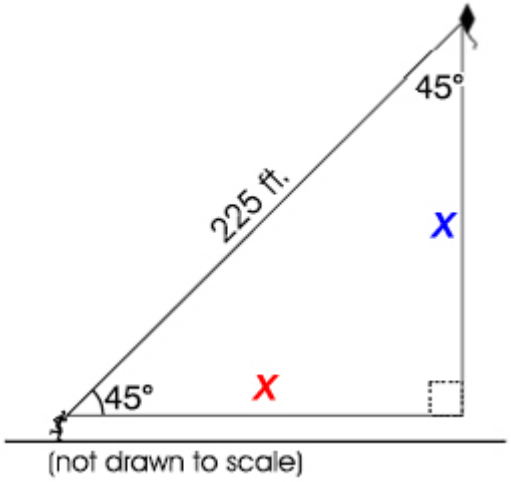
(Problem ID: 14862) RADIO_BUTTON [MA - 2001 - Spring - 17]



Let's label the length of the two sides y and x.

What is the relationship between y and x?

(Problem ID: 14863) RADIO_BUTTON [MA - 2001 - Spring - 17]



Now that we know the two legs of the triangle are congruent, we can setup an equation to solve for x, the kite's height. Which of the following equations is correct?

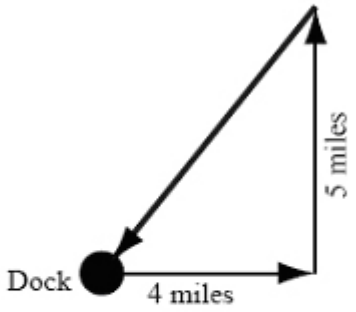
(Problem ID: 14864) RADIO_BUTTON [MA - 2001 - Spring - 17]

We have the equation $225^2 = x^2 + x^2$. To find approximately how high above the ground the kite will be, solve for x and choose the nearest answer choice.

34.) "2002.re.26.10.s" (Problem ID: 13853) RADIO_BUTTON [MA - 2002 - FALL - 26]

No knowledge components have been assigned

A boat traveled 4 miles due east away from a dock. Then it turned and traveled 5 miles due north. Finally, it turned again and traveled back to the dock as shown in the figure below.



Which of the following is closest to the total distance the boat traveled?

A. 12 miles

B. 13 miles

C. 15 miles

D. 18 miles

Answers: (Interface Type: RADIO_BUTTON)
✗ **A**
✗ **B**
✓ **C**
✗ **D**

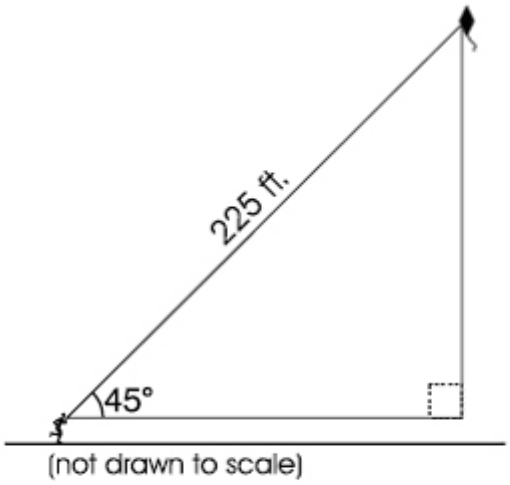
(Problem ID: 13854) RADIO_BUTTON [MA - 2002 - FALL - 26]
How many miles does the boat travel on the return trip?

(Problem ID: 13855) RADIO_BUTTON [MA - 2002 - FALL - 26]
Now that we know the sides of the triangle are 4, 5, and $\sqrt{41}$, approximately how many miles does the boat travel in total?

End Random Order Section Begin Random Order Section

35.) "2001.17.10.geo.h" (Problem ID: 15425) RADIO_BUTTON [MA - 2001 - Spring - 17]

No knowledge components have been assigned



It is believed that the best angle to fly a kite is 45°. If you fly a kite at this angle and let out 225 feet of string, **approximately** how high above the ground will the kite be?

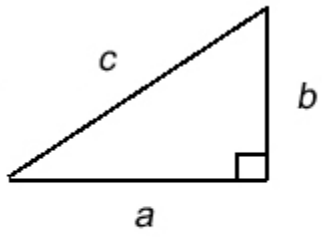
Answers: (Interface Type: RADIO_BUTTON)

✗ **A. 250 feet**
✗ **B. 200 feet**
✓ **C. 150 feet**
✗ **D. 100 feet**

Hint 1:
This is a 45-45-90 triangle. If a right triangle has an angle of 45 degrees, then the third angle is also 45 degrees.

If a triangle has two angles of the same measure, it is an isosceles triangle. The sides opposite the congruent angles are also equal in length.

Now that we know the two legs of the triangle are congruent, we can solve for the kite's height.
Hint 2:



$a^2 + b^2 = c^2$

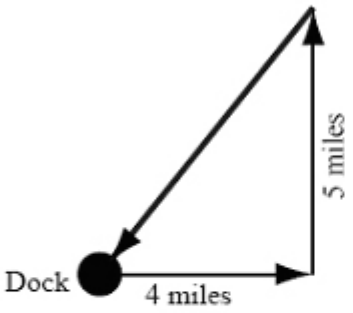
Since the triangle is a right triangle, we can use the Pythagorean Theorem.
Refer to your reference sheet for the Pythagorean Theorem.
Hint 3:
If we let x be the height of the kite, then the two legs are both of length x. The equation

is:
225? = x? + x?
Hint 4:
50625 = x? + x?
50625 = 2x?
50625 / 2 = 2x? / 2
50625 / 2 = x?
x? = 25312.5
Now find which of the answer choices is closest to the square root of 15312.5.
Hint 5:
The square root of 15312.5 is approximately 159. The answer choice C. 150 feet is closest to 159. Choose answer choice C.

36.) "2002.re.26.10.h" (Problem ID: 15429) RADIO_BUTTON [MA - 2002 - FALL - 26]

No knowledge components have been assigned

A boat traveled 4 miles due east away from a dock. Then it turned and traveled 5 miles due north. Finally, it turned again and traveled back to the dock as shown in the figure below.



Which of the following is closest to the total distance the boat traveled?

A. 12 miles

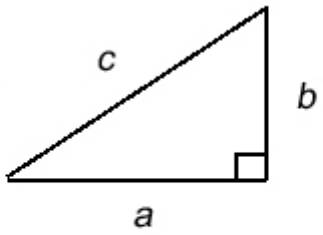
B. 13 miles

C. 15 miles

D. 18 miles

Answers: (Interface Type: RADIO_BUTTON)
✗ **A**
✗ **B**
✓ **C**
✗ **D**

Hint 1:



$a^2 + b^2 = c^2$

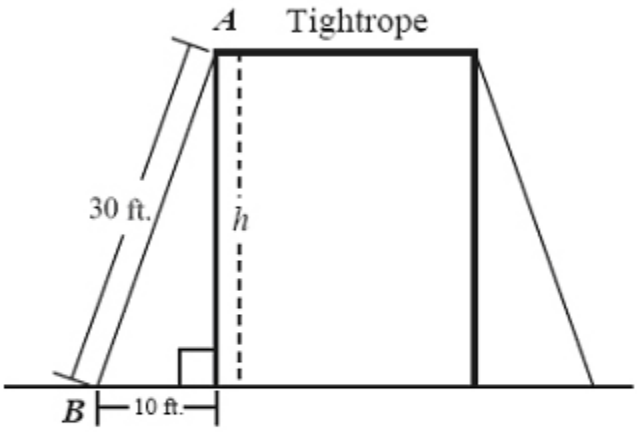
Use the Pythagorean Theorem to setup an equation to solve for the distance of the hypotenuse, the distance traveled during the return trip. Refer to your reference sheet to find the Pythagorean Theorem or look at the image above.
Hint 2:
The equation you set up to solve for the distance of the return trip should look like this:
4? + 5? = c?
Simplify by taking the squares of the constants.
16 + 25 = c?
Hint 3:
c? = 41
c = $\sqrt{}$41
Now that you have each of the individual distances traveled by the boat, add them up to find the total distance traveled.
Hint 4:
total distance = 4 + 5 + $\sqrt{}$41
total distance = 9 + $\sqrt{}$41
Hint 5:
$\sqrt{}$41 is approximately 6.
total distance = 9 + 6 = 15
Choose answer choice C. 15 miles.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

37.) "2002.re.40.10.s" (Problem ID: 13851) RADIO_BUTTON [MA - 2002 - FALL - 40]

No knowledge components have been assigned

In order to stabilize a tightrope at a circus, a wire that has a length of 30 feet is attached from the top of the vertical support at point A to point B on the ground. Point B is 10 feet from the base of the vertical support as shown in the figure below.



Based on this information, which of the following is closest to the value of h, the height of the vertical support?

A. 16 feet

B. 20 feet

C. 28 feet

D. 32 feet

Answers: **(Interface Type: RADIO_BUTTON)**

✗ **A**
✗ **B**
✓ **C**
✗ **D**

(Problem ID: 14666) RADIO_BUTTON [MA - 2002 - FALL - 40]

No knowledge components have been assigned

To find the height of the vertical support, we need to find the value of h. Using the given information, you can setup an equation to solve for h. Which of the following equations can be used to solve for h?

Answers: **(Interface Type: RADIO_BUTTON)**

(Problem ID: 13852) RADIO_BUTTON [MA - 2002 - FALL - 40]

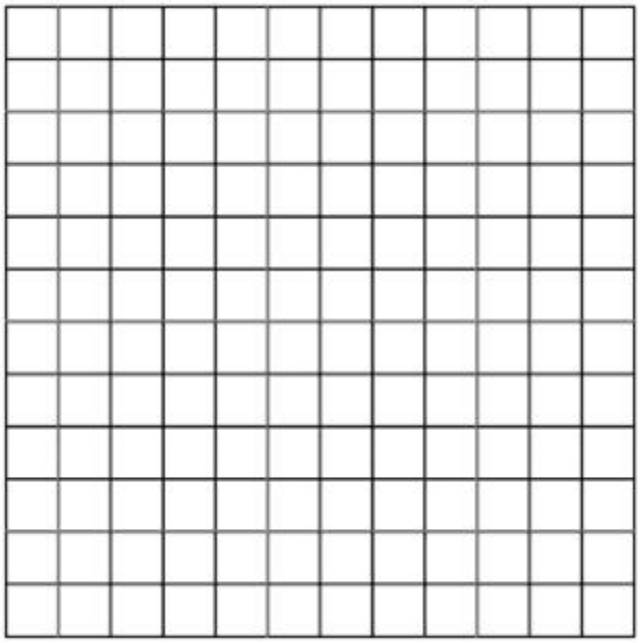
No knowledge components have been assigned

Now that we have the equation $30^2 = h^2 + 10^2$. We need to solve for the value of h, which is the height of the vertical support. Which of the following is closest to the value of h?

Answers: **(Interface Type: RADIO_BUTTON)**

38.) "2003_7_10_s (2006/08/30 21:12:31)" (Problem ID: 12800) RADIO_BUTTON [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



On the coordinate plane, what is the distance between the points (3, 4) and (11, 10)?

Answers: (Interface Type: RADIO_BUTTON)

✓ 10

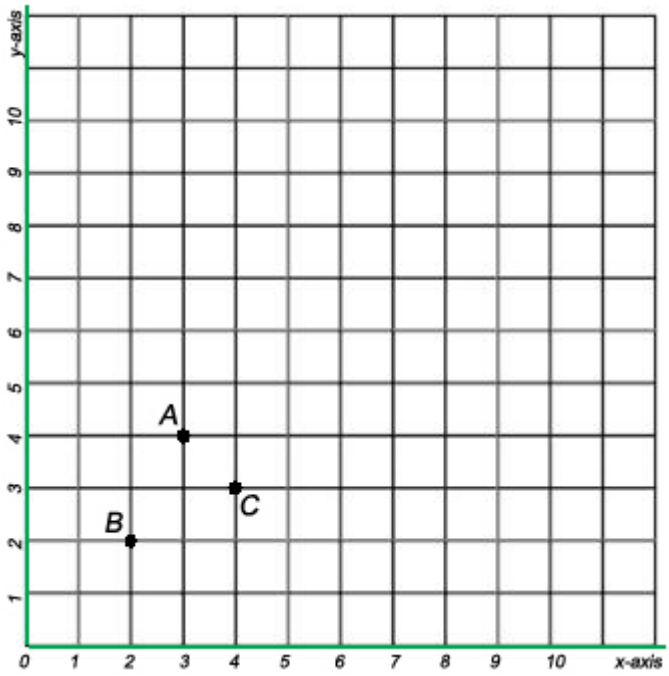
✗ 14

✗ 5

✗ 7

(Problem ID: 12801) RADIO_BUTTON [MA - 2003 - SPRING - 7]

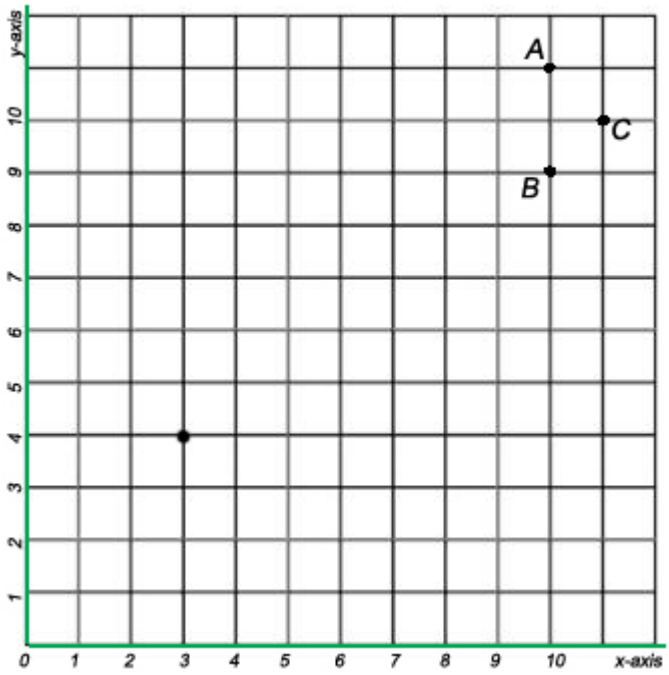
No knowledge components have been assigned



To make sense of this problem, you can start by drawing a picture. Lets start by plotting the point (3, 4). Here is the x and y axis, which of the points is (3, 4)?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 12802) RADIO_BUTTON [MA - 2003 - SPRING - 7]

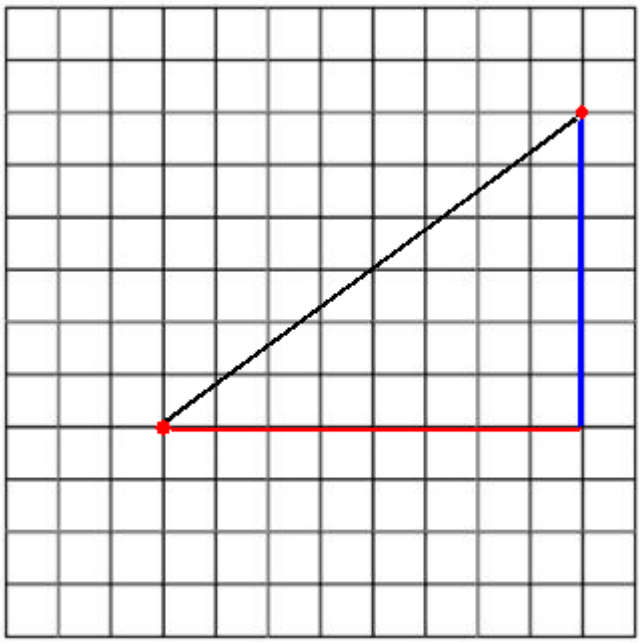
No knowledge components have been assigned



Let's continue and plot (11, 10). Which of the points is (11, 10)?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 12803) TEXT_FIELD [MA - 2003 - SPRING - 7]

No knowledge components have been assigned



The distance between two points can be found by finding the length of the hypotenuse of the triangle shown. To do this we need to use the Pythagorean Theorem, and in order to use that we need the lengths of the two legs. What is the length of the red triangle leg parallel to the x-axis?
Answers: (Interface Type: TEXT_FIELD)

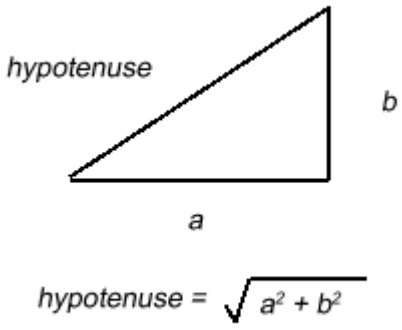
(Problem ID: 12804) TEXT_FIELD [MA - 2003 - SPRING - 7]

No knowledge components have been assigned

What is the length of the blue triangle leg parallel to the y-axis?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 12805) TEXT_FIELD [MA - 2003 - SPRING - 7]

No knowledge components have been assigned

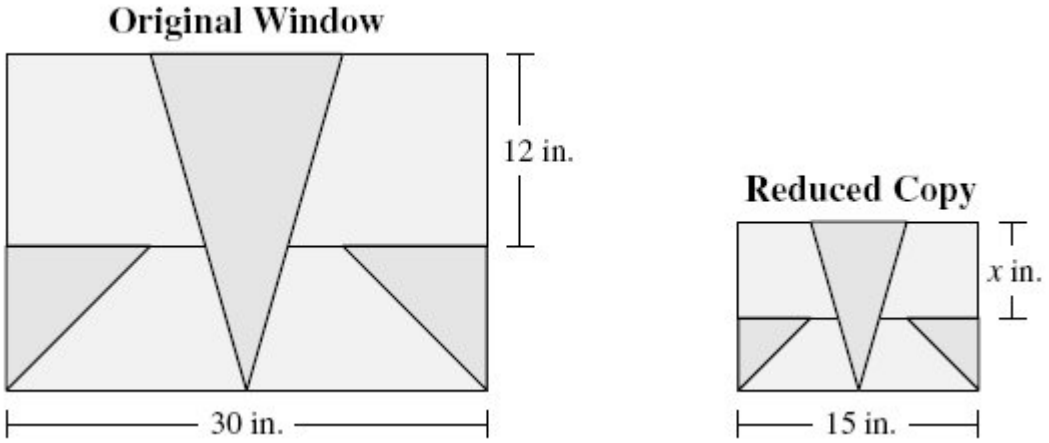


Now that we have the lengths of a and b, we can use the Pythagorean Theorem. What is the length of the hypotenuse?
Answers: (Interface Type: TEXT_FIELD)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

39.) "pre_2006m_16_gr10_nocalc" (Problem ID: 21784) TEXT_FIELD [MA - 2006 - MAR - 16]

No knowledge components have been assigned



Leonie wants to build a reduced copy of a stained-glass window. She wants the shapes in her reduced copy to be similar to the shapes in the original window. Selected dimensions of each window are shown below.

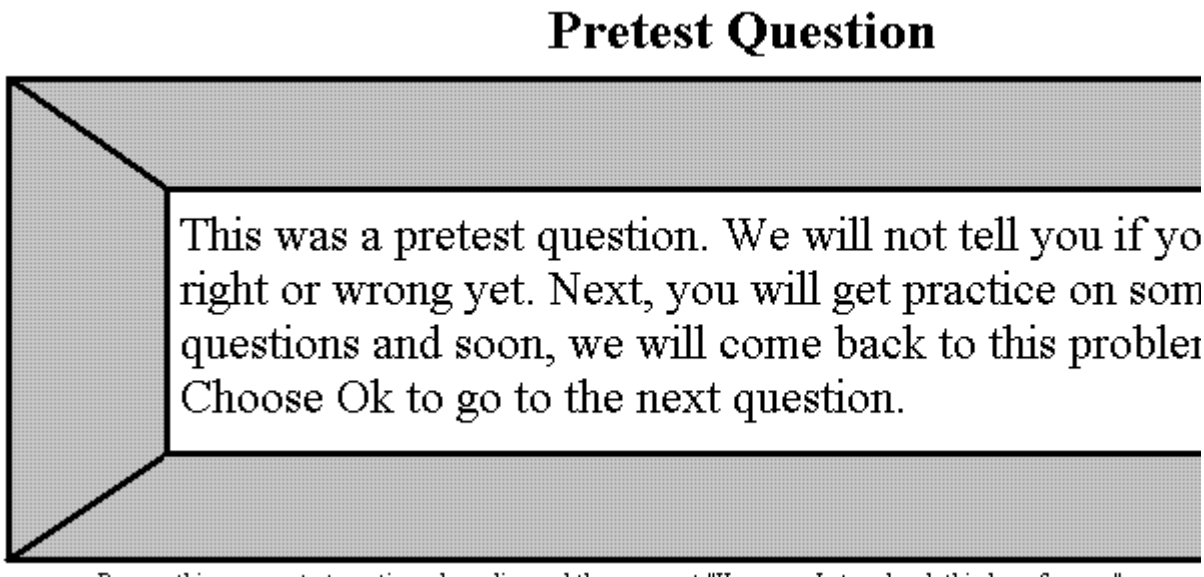
What value of x, in inches, should Leonie use for her reduced copy?

Answers: (Interface Type: TEXT_FIELD)

✓ 6

(Problem ID: 21785) RADIO_BUTTON [MA - 2006 - MAR - 16]

No knowledge components have been assigned



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit.

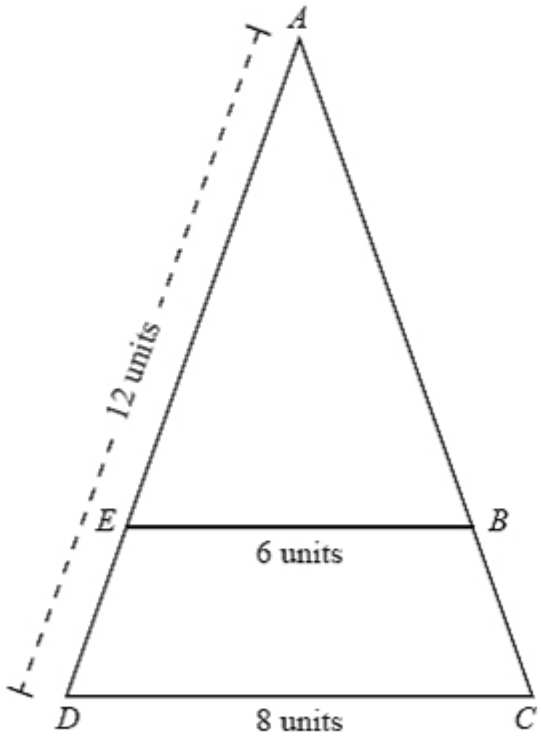
Answers: **(Interface Type: RADIO_BUTTON)**

40.) "pre_2002_re_18_10_s" (Problem ID: 21750) TEXT_FIELD [MA - 2002 - FALL - 18]

No knowledge components have been assigned

Triangle ACD shown below is similar to triangle ABE.

- the measure of $\overline{EB}$ = 6 units
- the measure of $\overline{DC}$ = 8 units
- the measure of $\overline{AD}$ = 12 units



What is the measure of $\overline{AE}$?

Answers: **(Interface Type: TEXT_FIELD)**

(Problem ID: 21751) RADIO_BUTTON [MA - 2002 - FALL - 18]

No knowledge components have been assigned

Pretest Question

This was a pretest question. We will not tell you if yo
right or wrong yet. Next, you will get practice on som
questions and soon, we will come back to this problen
Choose Ok to go to the next question.

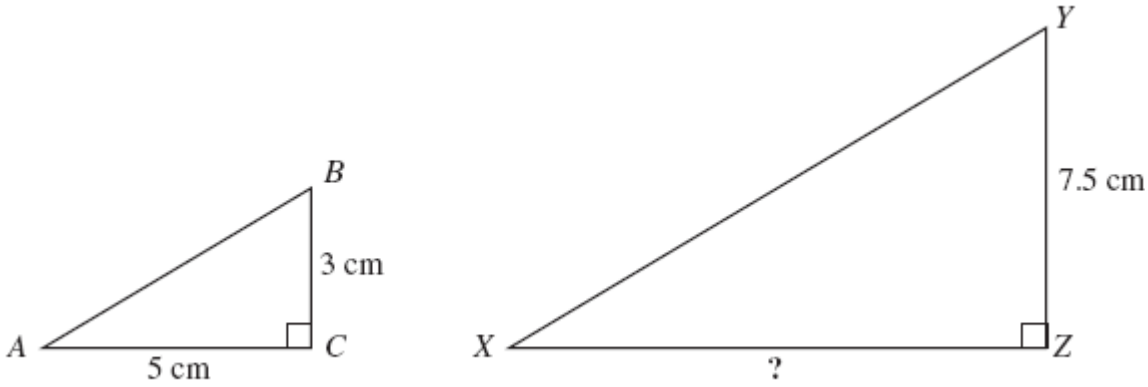
Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

41.) "2004_25_gr10" (Problem ID: 12652) RADIO_BUTTON [MA - 2004 - Spring - 25]

No knowledge components have been assigned



In the picture shown above, triangle ABC is similar to XYZ.

What is the length of XZ?
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 2.0 cm**
✗ **B. 4.5 cm**
✓ **C. 12.5 cm**
✗ **D 22.5 cm**

(Problem ID: 12653) RADIO_BUTTON [MA - 2004 - Spring - 25]
Two triangles that are similar have equal corresponding angles and their

corresponding sides are proportional. Which side of ABC corresponds to XZ?

(Problem ID: 12654) RADIO_BUTTON [MA - 2004 - Spring - 25]

$A.\ \frac{7.5}{5} = \frac{XZ}{3}$ $C.\ \frac{7.5}{XZ} = \frac{5}{3}$

$B.\ \frac{7.5}{3} = \frac{XZ}{5}$ $D.\ \frac{7.5}{1} = \frac{XZ}{3}$

Now let us set up a ratio between corresponding sides for which we know the measurement of and XZ and AC.

Which of the above is accurate?

(Problem ID: 12655) ALGEBRA_FIELD [MA - 2004 - Spring - 25]
So, now using the ratio we just found. Let's solve for XZ. What is the answer?

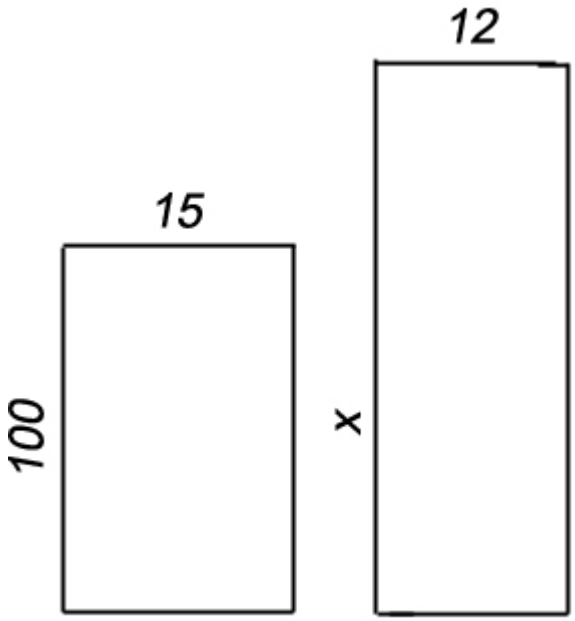
42.) "2002.re.29.10.me.s" (Problem ID: 15112) RADIO_BUTTON [MA - 2002 - FALL - 29]

No knowledge components have been assigned

Thomas is installing a 100-foot-long roll of a 15-foot-wide piece of carpet. Thomas located a roll of similar carpeting that was 12 feet wide. How many feet of the 12-foot-wide roll of carpeting does Thomas need to equal the area of the 15-foot-wide roll of carpeting?

Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 80 feet**
✗ **B. 112 feet**
✓ **C. 125 feet**
✗ **D. 154 feet**

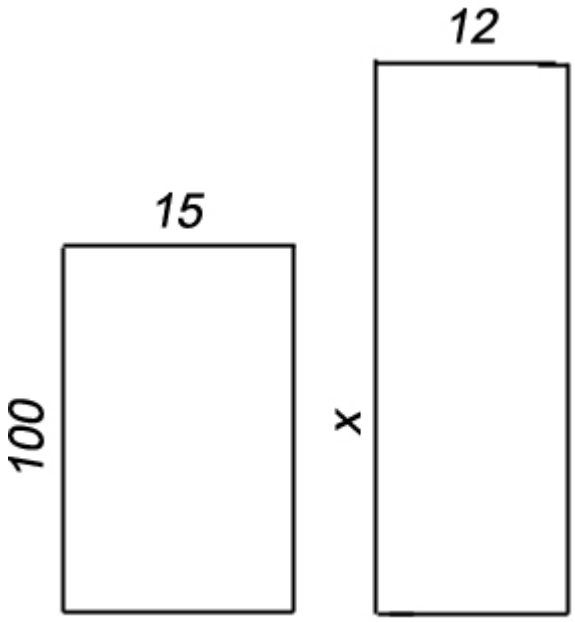
(Problem ID: 15113) TEXT_FIELD [MA - 2002 - FALL - 29]



The image above shows what we know about the dimensions of the two pieces of carpet. In order to solve this problem, we're going to use the fact that the two pieces of carpet need to have the same area. First, we must find their area.

How many square feet is the piece of carpet that is 15 feet wide and 100 feet long.?

(Problem ID: 15114) RADIO_BUTTON [MA - 2002 - FALL - 29]



The image above shows what we know about the dimensions of the two pieces of carpet. In order to solve this problem, we're going to use the fact that the two pieces of carpet need to have the same area. Since we have found the area of one of them, we

need to find the area of the other.

Which of the following expressions represents the area of the piece of carpet that is 12 feet wide?

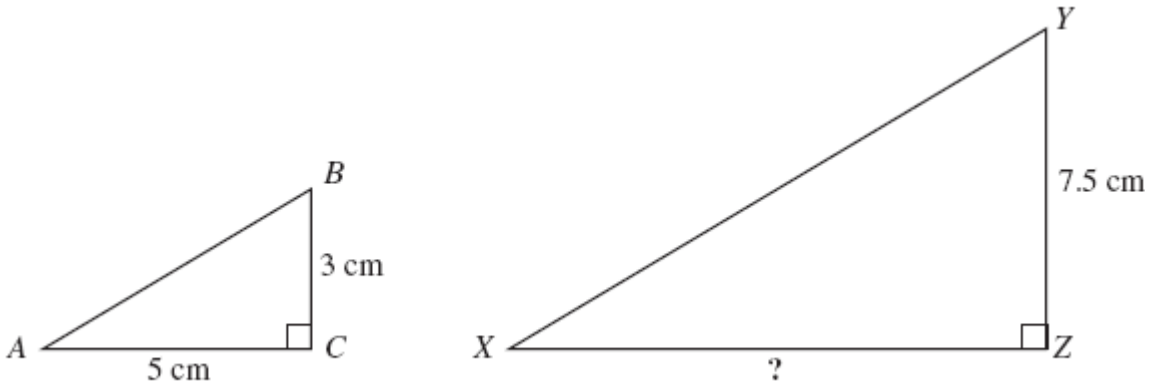
(Problem ID: 15115) RADIO_BUTTON [MA - 2002 - FALL - 29]

Since we know that the area of the two carpets must be equal, we can set up an equation by equating the two areas we have found.
12x = 1500
The value of x is the length required for the 12 foot wide carpet to have the same area as the 15 foot wide carpet.
How many feet of the 12 foot wide carpet does Thomas need to equal the area of the 15 foot wide carpet?

End Random Order Section Begin Random Order Section

43.) "2004_25_gr10_HINT" (Problem ID: 15514) RADIO_BUTTON [MA - 2004 - Spring - 25]

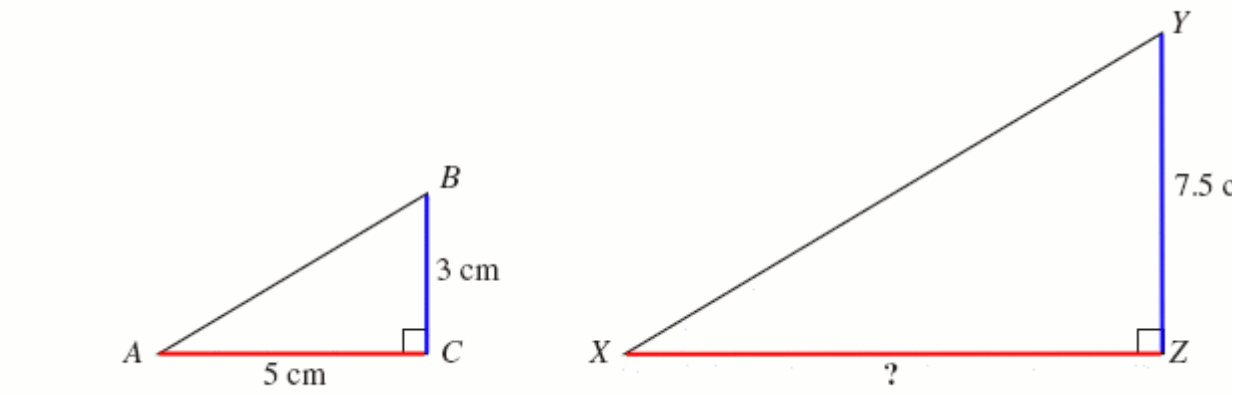
No knowledge components have been assigned



In the picture shown above, triangle ABC is similar to XYZ.

What is the length of XZ?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 2.0 cm
✗ B. 4.5 cm
✓ C. 12.5 cm
✗ D 22.5 cm

Hint 1:



To find the length of XZ, we will use the fact that ABC and XYZ are similar. First, determine the relationship between the corresponding sides of the two triangles.
Hint 2:
We will need to set up a ratio between the corresponding sides. Try the long blue line over the smaller blue as a ratio. Set this equal to the long red line over the smaller red line.
Hint 3:

$$\frac{7.5}{3} = \frac{XZ}{5}$$

The equation above represents the ratios of corresponding sides being set equal to each other.

We can use this ratio to solve for XZ. Start by multiplying both sides by 5.
Hint 4:
XZ = 5(7.5)/3 = 12.5

The answer is 12.5

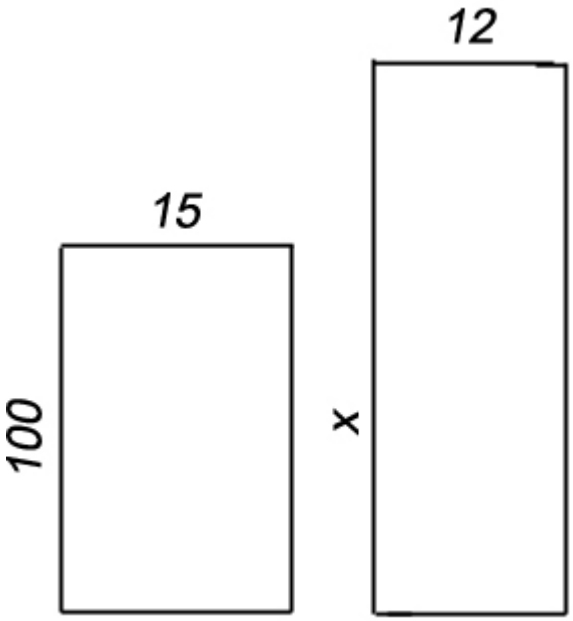
44.) "2002.re.29.10.me.h" (Problem ID: 15421) RADIO_BUTTON [MA - 2002 - FALL - 29]

No knowledge components have been assigned

Thomas is installing a 100-foot-long roll of a 15-foot-wide piece of carpet. Thomas located a roll of similar carpeting that was 12 feet wide. How many feet of the 12-foot-wide roll of carpeting does Thomas need to equal the area of the 15-foot-wide roll of carpeting?

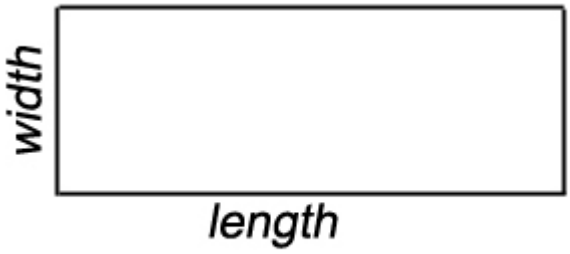
Answers: (Interface Type: RADIO_BUTTON)
✗ **A. 80 feet**
✗ **B. 112 feet**
✓ **C. 125 feet**
✗ **D. 154 feet**

Hint 1:



The image above shows what we know about the dimensions of the two pieces of carpet. In order to solve this problem, use the fact that the two pieces of carpet need to have the same area.

Find the area of both of the carpets and set up an equation equating the two areas. Then solve for x, the length of the 12-foot wide carpet.
Hint 2:



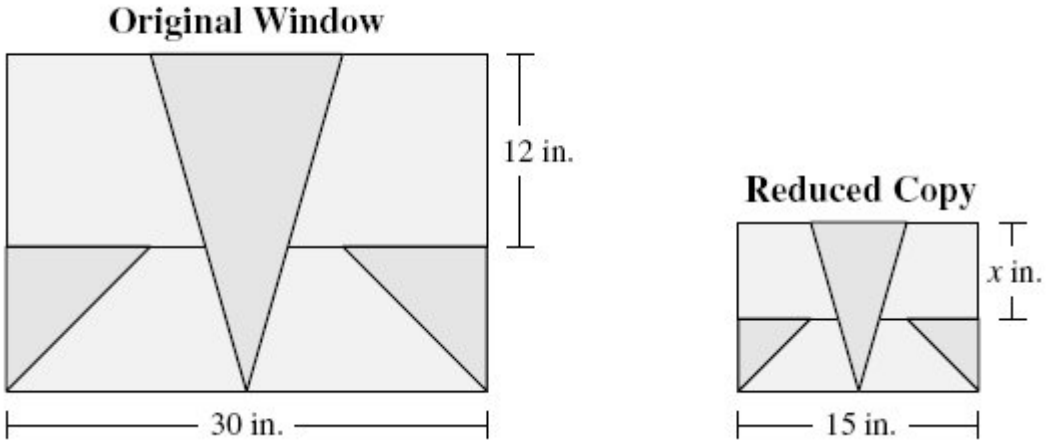
*Area of a Rectangle = width * length*

The equation for the area of a rectangle is shown above.
You can also refer to your reference sheet for the equation for the area of a rectangle.
Hint 3:
The equation equating the areas of the two carpets is:
12x = 1500
Hint 4:
12x / 12 = 1500 / 12
x = 1500 / 12
Hint 5:
x = 125 The length of the 12-foot wide carpet needs to be 125 feet. Choose answer choice C. 125 feet

End Random Order Section
End '{Problem}' Section Begin Random Order Section

45.) "2006m_16_gr10_nocalc" (Problem ID: 14094) TEXT_FIELD [MA - 2006 - MAR - 16]

No knowledge components have been assigned



Leonie wants to build a reduced copy of a stained-glass window. She wants the shapes in her reduced copy to be similar to the shapes in the original window. Selected dimensions of each window are shown below.

What value of x, in inches, should Leonie use for her reduced copy?

Answers: (Interface Type: TEXT_FIELD)

✔ 6

(Problem ID: 14096) RADIO_BUTTON [MA - 2006 - MAR - 16]

No knowledge components have been assigned

$A.\ \frac{30}{12} = \frac{x}{15}$ $C.\ \frac{30}{15} = \frac{12}{x}$

$B.\ \frac{12}{x} = \frac{15}{30}$ $D.\ \frac{30}{x} = \frac{12}{15}$

Because the shapes in the windows are similar, we can set up a ratio between the sides. Which of the above is a correct ratio?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14097) TEXT_FIELD [MA - 2006 - MAR - 16]

No knowledge components have been assigned

$$\frac{30}{15} = \frac{12}{x}$$

Now we can return to the original question, use the ratio we found to solve for x.

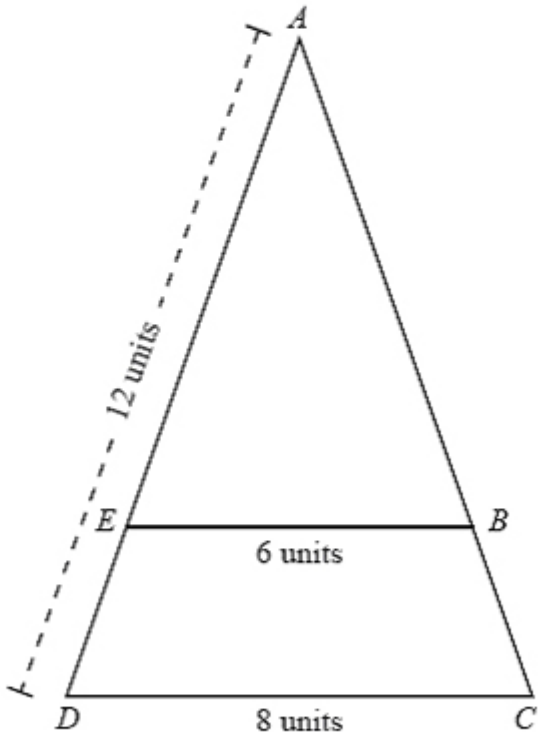
Answers: (Interface Type: TEXT_FIELD)

46.) "2002.re.18.10.s" (Problem ID: 13856) TEXT_FIELD [MA - 2002 - FALL - 18]

No knowledge components have been assigned

Triangle ACD shown below is similar to triangle ABE.

- the measure of $\overline{EB} = 6$ units
- the measure of $\overline{DC} = 8$ units
- the measure of $\overline{AD} = 12$ units



What is the measure of $\overline{AE}$?

Answers: (Interface Type: TEXT_FIELD)

✓ **9**

(Problem ID: 13857) RADIO_BUTTON [MA - 2002 - FALL - 18]

No knowledge components have been assigned

Corresponding sides of similar triangles have the same ratio. Which side corresponds to side AE?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13858) RADIO_BUTTON [MA - 2002 - FALL - 18]

No knowledge components have been assigned

A $\frac{8}{6} = \frac{x}{12}$ B $\frac{6}{8} = \frac{x}{12}$

C $\frac{6}{12} = \frac{x}{8}$ D $\frac{12}{6} = \frac{x}{8}$

Which of the above equations represents the ratios between the corresponding sides?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13859) TEXT_FIELD [MA - 2002 - FALL - 18]

No knowledge components have been assigned

$$\frac{6}{8} = \frac{x}{12}$$

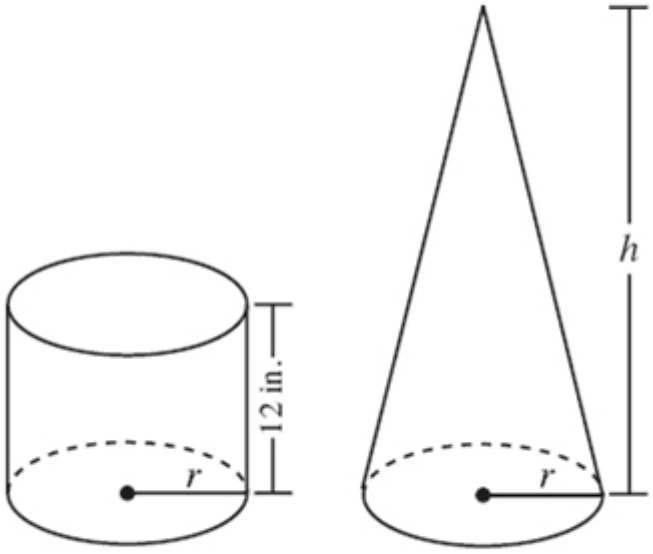
Using the equation for x shown above, find the value of x. What is the value of x, the length of side AE?
Answers: (Interface Type: TEXT_FIELD)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

47.) "pre_2003_RE_12_10_ME_s" (Problem ID: 21754) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

The right cylinder and right cone shown below have the same radius and volume. The cylinder has a height of 12 inches.



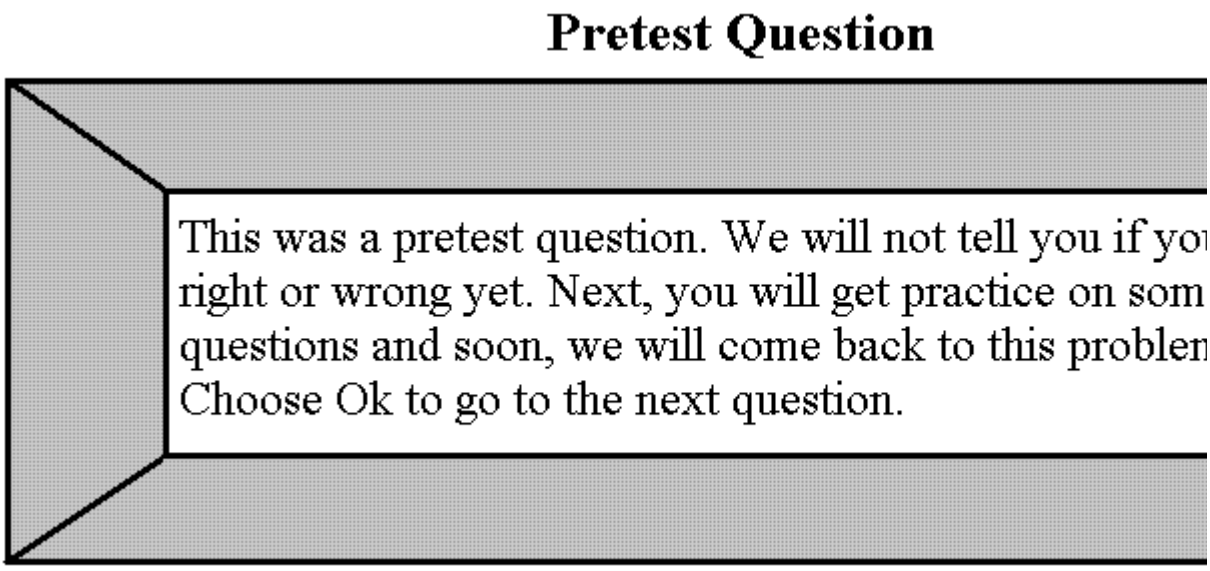
What is h, the height of the cone?

Answers: **(Interface Type: RADIO_BUTTON)**

- ✗ **A. 18 inches**
- ✗ **B. 24 inches**
- ✗ **C. 36 inches**
- ✗ **D. 42 inches**

(Problem ID: 21755) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned



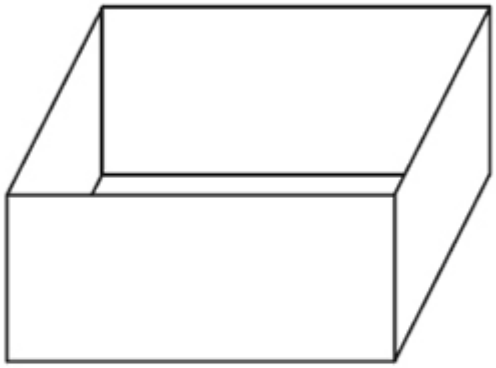
Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit.
Answers: (Interface Type: RADIO_BUTTON)

48.) "pre_2003_re_35_10_me_s" (Problem ID: 21641) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Jennifer keeps a box under her bed to store clothes. The box is in the shape of a rectangular prism as shown in the figure below.



Jennifer's sister, Molly, made a box that had the same height as Jennifer's box. Molly, however, realized that she could triple the length and double the width and it would still fit under her bed.

What is the ratio of the volume of Molly's box to the volume of Jennifer's box?

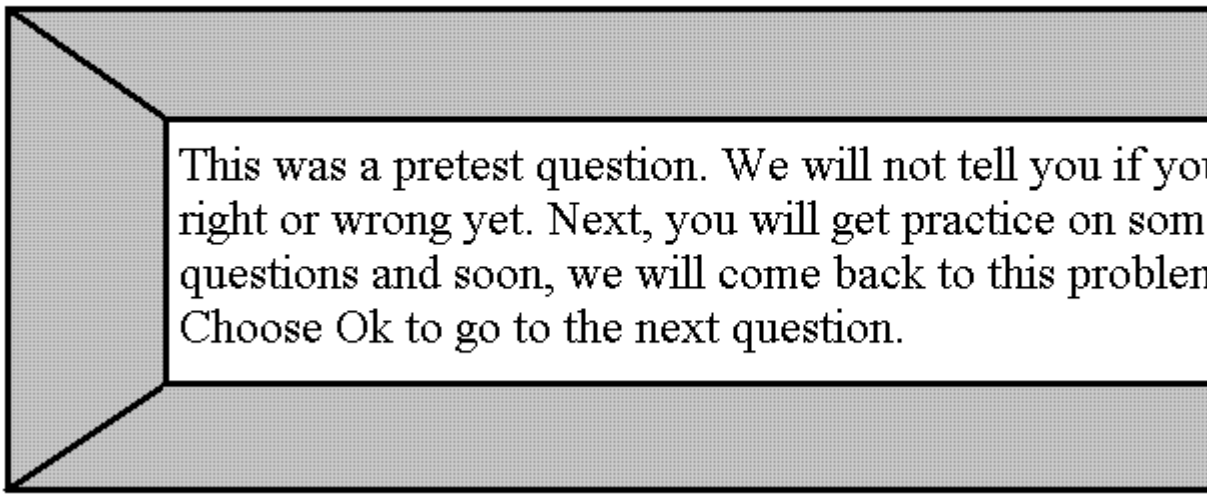
Answers: (Interface Type: RADIO_BUTTON)

- ✗ **A. 6 : 1**
- ✗ **B. 12 : 1**
- ✗ **C. 36 : 1**
- ✗ **D. 216 : 1**

(Problem ID: 21642) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Pretest Question



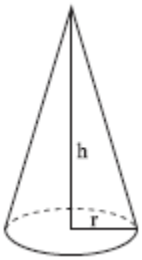
Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Choose Ok and click Submit.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

49.) "2000_13a_10(2006/11/20 18:01:24)" (Problem ID: 14976) TEXT_FIELD [MA - 2000 - SPRING - 13a]

No knowledge components have been assigned



If the height of the cone, shown above, is doubled, the volume of the cone is how many times larger?
Answers: (Interface Type: TEXT_FIELD)
✓ **2**

(Problem ID: 14978) RADIO_BUTTON [MA - 2000 - SPRING - 13a]

First, we need to know how to find the volume of a cone. What is the volume of a cone with r=2 and h=2?

(Problem ID: 21630) RADIO_BUTTON [MA - 2000 - SPRING - 13a]

Now, let's compare this volume of $8\pi/3$ to the volume of a cone with a radius still of 2, but with a new height of 4 (double the height). What would the volume of this new cone be?

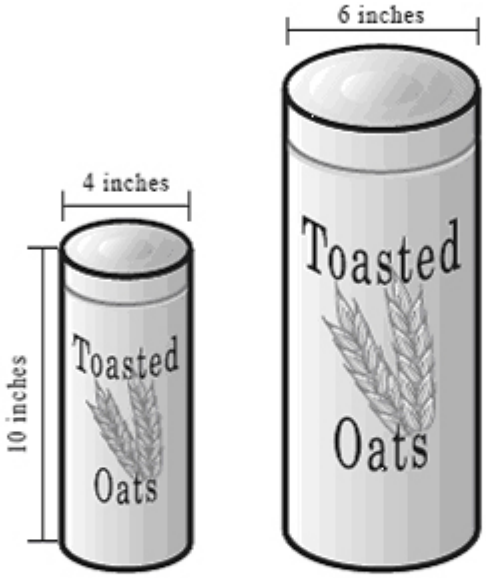
(Problem ID: 14980) TEXT_FIELD [MA - 2000 - SPRING - 13a]

Now, let's compare our two cones. The cone with height 2 has a volume of $8\pi/3$ and the cone with height 4 has a volume of $16\pi/3$. How many times bigger is the cone with twice the height?

50.) "2002.4.10.s" (Problem ID: 13864) RADIO_BUTTON [MA - 2002 - SPRING - 4]

No knowledge components have been assigned

A company packages breakfast cereal in the two sizes of right cylindrical containers shown below. The containers are similar in shape.



How many cubic inches does the large container hold?

A. 90π cubic inches

B. 135π cubic inches

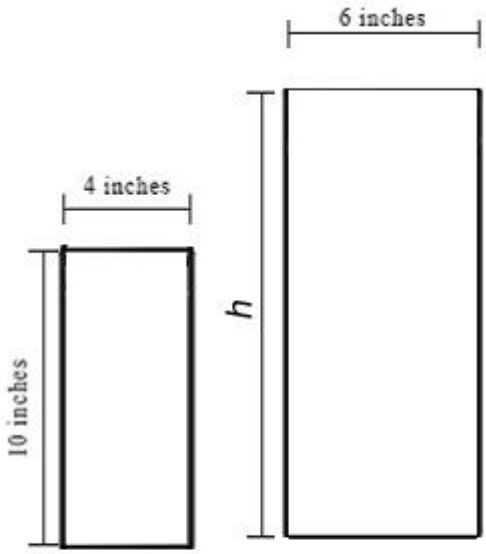
C. 360π cubic inches

D. 540π cubic inches

Answers: (Interface Type: RADIO_BUTTON)

✓ **A**
✗ **B**
✗ **C**
✗ **D**

(Problem ID: 13865) RADIO_BUTTON [MA - 2002 - SPRING - 4]



A) $\frac{h}{6}=\frac{4}{10}$ C) $\frac{4}{10}=\frac{6}{h}$

B) $\frac{10}{6}=\frac{h}{4}$ D) $\frac{6}{4}=\frac{10}{h}$

Above is a cleaner version of the problem's picture. To solve for the volume of the larger cylinder, you first need to solve for its height, h.
Which of the above equations correctly represents the relationships between the lengths of the sides of the cylinders?

(Problem ID: 14667) TEXT_FIELD [MA - 2002 - SPRING - 4]

C) $\frac{4}{10}=\frac{6}{h}$

Now that you have the equation for the height of the cylinder, solve for h in the equation shown above. What is the height of the cylinder?

(Problem ID: 13866) RADIO_BUTTON [MA - 2002 - SPRING - 4]

Now that you have the height of the larger cylinder, you can find the volume. Find the equation for the volume of a right cylinder on your MCAS reference sheet.
V= π * r?* h
The radius is half of the width. What is the volume of the larger right cylinder?

51.) "2002.40.10.me.s" (Problem ID: 14872) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned
What is the effect on the circumference of a circle if the circle's radius is doubled?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. The circumference is multiplied by 2**
✗ **B. The circumference is multiplied by 4**

✗ C. The circumference is multiplied by 8
✗ D. The circumference stays the same

(Problem ID: 14873) RADIO_BUTTON [MA - 2002 - SPRING - 10]
First, let's find out what the circumference of a circle is when the radius has not been doubled. Which of the following completes the equation for the circumference of a circle C = _____.

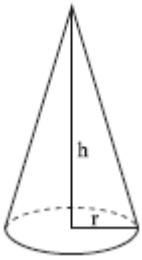
(Problem ID: 14874) RADIO_BUTTON [MA - 2002 - SPRING - 10]
Next, let's find the circumference of a circle whose radius has been doubled. Which of the following completes the equation for the circumference of a circle whose radius is doubled C = _____.

(Problem ID: 14875) RADIO_BUTTON [MA - 2002 - SPRING - 10]
The circumference of a circle is:
$2\pi r$
The circumference of a circle whose radius is doubled is:
$4\pi r$
What is the effect on the circumference of a circle if the circle's radius is doubled?

End Random Order Section Begin Random Order Section

52.) "2000_13a_10Hint(2006/11/20 18:01:24)" (Problem ID: 21625) TEXT_FIELD [MA - 2000 - SPRING - 13a]

No knowledge components have been assigned



If the height of the cone, shown above, is doubled, the volume of the cone is how many times larger?
Answers: (Interface Type: TEXT_FIELD)
✓ 2

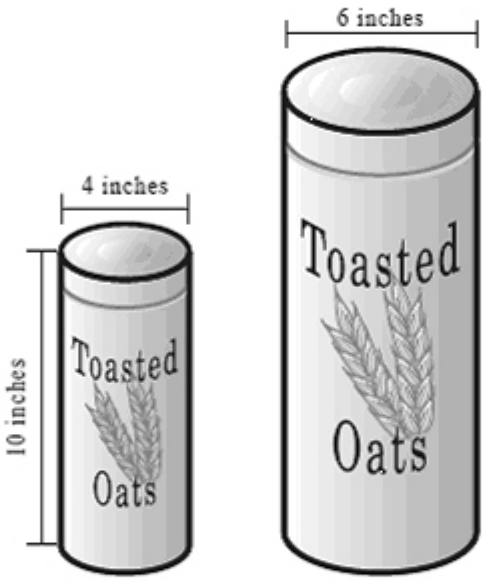
Hint 1:
First, use your reference sheet to find the volume of a cone.
Hint 2:
Try using arbitrary values of h and r (such as 2) and find the Volume.
Hint 3:
Now, once you find the volume of the cone for h=2 and r=2, double the height, as told to do, and compare the new volume to the original volume.
Hint 4:
With h=2 and r=2 the volume is $8\pi/3$, when the height is doubled (h=4, r=2) the volume is $16\pi/3$

Hint 5:
If you divide the new volume (16π/3) by the original volume (8π/3) the amount which the volume changes can be found.
Hint 6:
(6π/3)/(8π/3)=2, so the volume doubles if the height is doubled. Enter 2.

53.) "2002.4.10.h" (Problem ID: 15417) RADIO_BUTTON [MA - 2002 - SPRING - 4]

No knowledge components have been assigned

A company packages breakfast cereal in the two sizes of right cylindrical containers shown below. The containers are similar in shape.



How many cubic inches does the large container hold?

A. 90π cubic inches

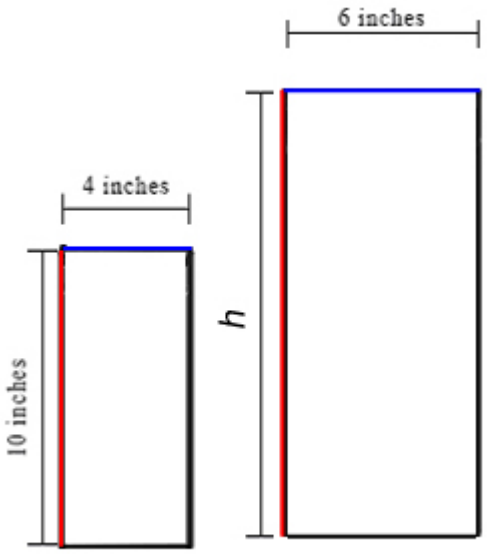
B. 135π cubic inches

C. 360π cubic inches

D. 540π cubic inches

Answers: (Interface Type: RADIO_BUTTON)
✓ **A**
✗ **B**
✗ **C**
✗ **D**

Hint 1:



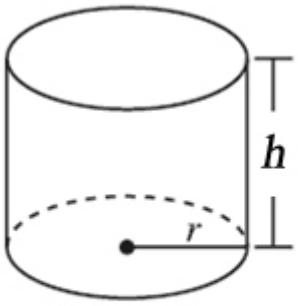
In order to find the volume of the large cylinder, first find the its height. To find the height, set up a ratio representing the relationship between the lengths of the sides of the cylinders and solve for the height.

The ratio between the width and height of the smaller cylinder is equal to the ratio of the width and height of the larger cylinder.
Hint 2:

$$\frac{4}{10} = \frac{6}{h}$$

The ratio between the width and height of the smaller cylinder is 4 / 10. The ratio between the width and height of the larger cylinder is 6 / h.

Solve the equation for the value of h, the height of the larger right cylinder.
Hint 3:



Volume of a Right Cylinder =

$$\pi r^2 * h$$

The height of the cylinder is 15.

Now solve for the volume of the right cylinder using the formula for the volume of a right cylinder.

Refer to your reference sheet for the formula for the volume of a right cylinder.
Hint 4:
The radius is half of the width which is 6 / 2 = 3. So, the volume of the cylinder is :
π * 3? * 15
Hint 5:
π * 9 * 15
The answer is 90 π Choose answer choice A.

54.) "2002.40.10.me.h" (Problem ID: 15409) RADIO_BUTTON [MA - 2002 - SPRING - 10]

No knowledge components have been assigned
What is the effect on the circumference of a circle if the circle's radius is doubled?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. The circumference is multiplied by 2**
✗ **B. The circumference is multiplied by 4**
✗ **C. The circumference is multiplied by 8**
✗ **D. The circumference stays the same**

Hint 1:
To solve this problem, find the ratio between the doubled-radius circumference and the normal circumference.

The formula for the circumference of a circle is:
C = 2πr
You can also refer to your reference sheet for the formula for the circumference of a circle.
Hint 2:
Find the circumference of a circle whose radius is doubled by substituting the r in the formula for the circumference of a circle with 2r.
Hint 3:
The formula for the circumference of a circle whose radius is doubled is:
C = 4πr
Hint 4:

$$ratio = \frac{4\pi r}{2\pi r}$$

$$ratio = \frac{4\cancel{\pi}\cancel{r}}{2\cancel{\pi}\cancel{r}}$$

$$ratio = \frac{4}{2}$$

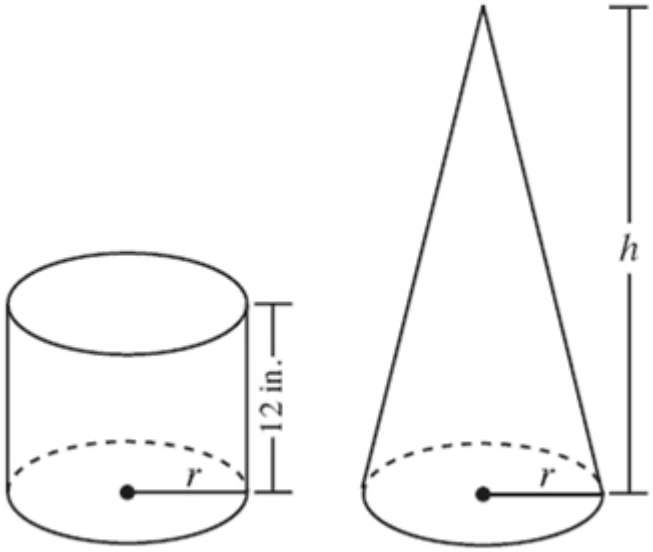
Ratio = 2
Since the ratio is 2, the effect of doubling the radius on the circumference of a circle is A.
The circumference is multiplied by 2
Hint 5:
false

End Random Order Section
End '{Problem}' Section Begin Random Order Section

55.) "2003.re.12.10.me.s" (Problem ID: 15116) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

The right cylinder and right cone shown below have the same radius and volume. The cylinder has a height of 12 inches.



What is h, the height of the cone?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 18 inches
✗ B. 24 inches
✓ C. 36 inches
✗ D. 42 inches

(Problem ID: 15117) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

Using the fact that the volume of the right cylinder and right cone are equal, we can construct an equation to solve for h.

First we need to find the volume of the right cylinder. Which of the following expressions represents the volume of the right cylinder?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 15118) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

Using the fact that the volume of the right cylinder and right cone are equal, we can

construct an equation to solve for h.

Now that we have the volume of the right cylinder, we need to find the volume of the right cone. Which of the following expressions represents the volume of the right cone?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 15119) RADIO_BUTTON [MA - 2003 - NOV - 12]

No knowledge components have been assigned

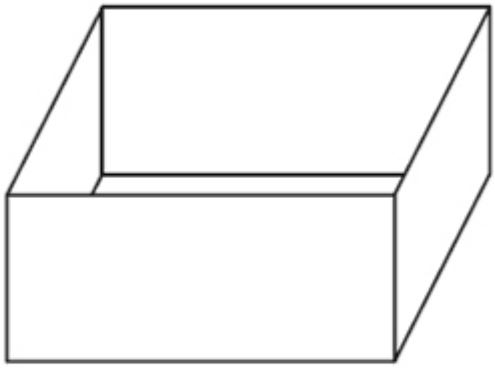
Now we can set up an equation equating the volumes of the two objects.
πr? * 12 = 1/3 πr? * h

What is *h*, the height of the cone?
Answers: (Interface Type: RADIO_BUTTON)

56.) "2003.re.35.10.me.s" (Problem ID: 15129) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Jennifer keeps a box under her bed to store clothes. The box is in the shape of a rectangular prism as shown in the figure below.



Jennifer's sister, Molly, made a box that had the same height as Jennifer's box. Molly, however, realized that she could triple the length and double the width and it would still fit under her bed.

What is the ratio of the volume of Molly's box to the volume of Jennifer's box?

Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 6 : 1**

✗ B. 12 : 1
✗ C. 36 : 1
✗ D. 216 : 1

(Problem ID: 15130) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

First, let's find the volume of a rectangular prism. Which of the following completes the equation for the volume of a rectangular prism V = _____.

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 15274) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Next, let's find the volume of a rectangular prism whose length has been tripled and width has been doubled. Which of the following completes the equation for the volume of such a rectangular prism V = _____.

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 15275) RADIO_BUTTON [MA - 2003 - NOV - 35]

No knowledge components have been assigned

Jennifer's box has a volume of:
l * w * h

Molly's box which has the same height as Jennifer's box, but triple the length and double the width has a volume of:
6 * l * w * h

What is the ratio of the volume of Molly's box to the volume of Jennifer's box?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section
End Linear Section

Module Name: 10thGradeAlgebra_IQP

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section
Begin Linear Section
Begin Random Order Section

1.) "pre_2000_3_10" (Problem ID: 15672) TEXT_FIELD [MA - 2000 - SPRING - 3]

No knowledge components have been assigned

If 3(2r-5) = 27, then 2r-5 equals

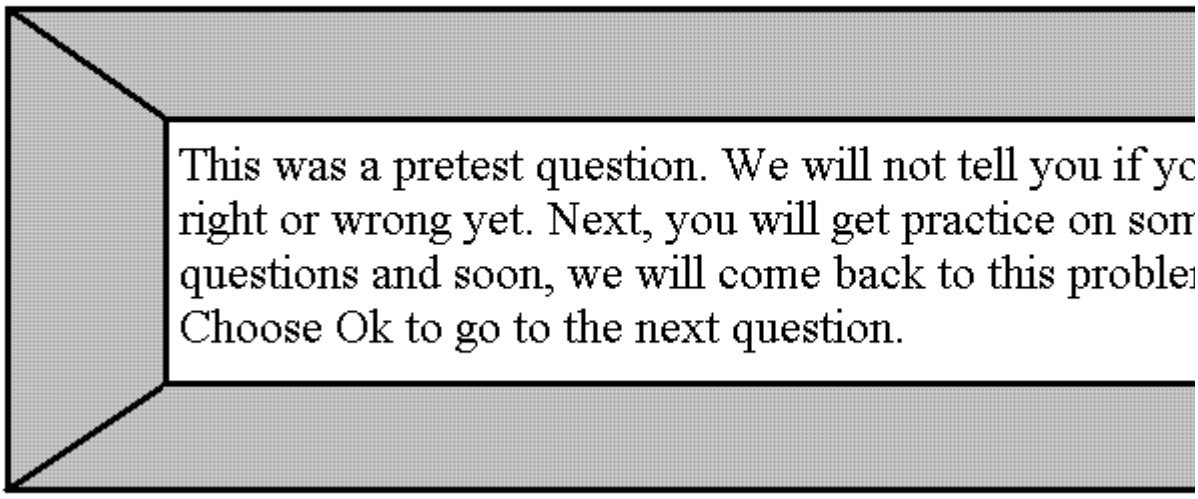
Answers: (Interface Type: TEXT_FIELD)

✓ **9**

(Problem ID: 15675) RADIO_BUTTON [MA - 2000 - SPRING - 3]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.

Answers: (Interface Type: RADIO_BUTTON)

2.) "pre_2000_11_10" (Problem ID: 15676) ALGEBRA_FIELD [MA - 2000 - Spring - 11]

No knowledge components have been assigned

Solve the following equation for x

$0.5(x - 8) = 0.2x + 11$

Answers: (Interface Type: ALGEBRA_FIELD)

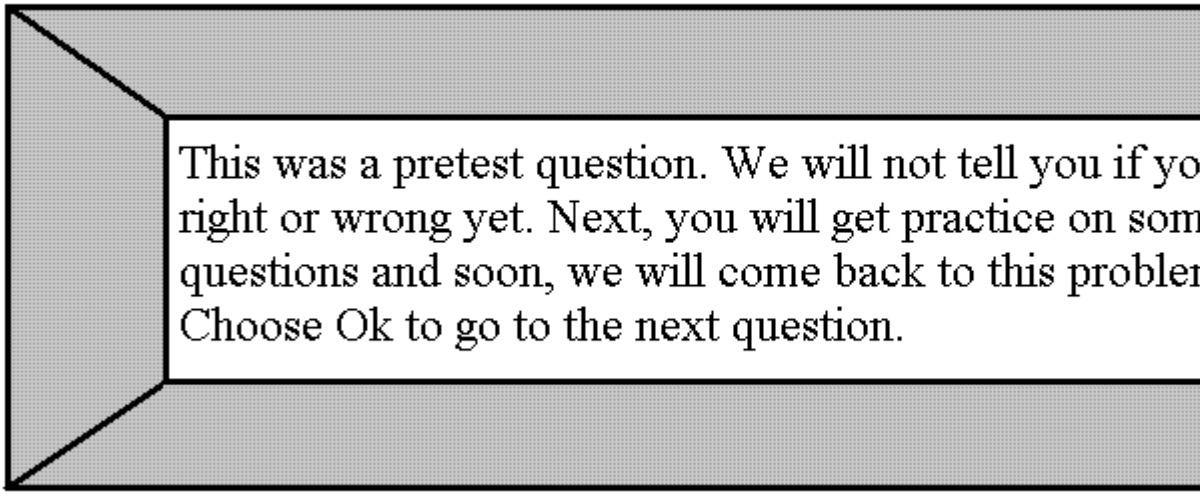
✓ **x=50**

✓ **50**

(Problem ID: 15677) RADIO_BUTTON [MA - 2000 - Spring - 11]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Please select Ok to continue.

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section

Begin Random Order Section

3.) "May 1998 gr 10 no 16" (Problem ID: 14512) RADIO_BUTTON [MA - 1998 - SPRING - 16]

No knowledge components have been assigned

Which of the following could be the next step in solving the equation $3(x + 2) = 3 - (x + 1)$?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. $3x + 6 = 3 - x - 1$**

✗ B. $3x + 2 = 3 - x - 1$

✗ C. $3x + 6 = 3 - x + 1$

✗ D. $3x + 5 = 3 - x + 1$

(Problem ID: 14998) RADIO_BUTTON [MA - 1998 - SPRING - 16]

If there were no variables in this equation, we would do the operations in the parentheses first (order of operations). However, we cannot simplify $(x + 2)$ or $(x + 1)$, so we need to use the distributive property as the next step. Which of the following is the distributive property?

(Problem ID: 14513) ALGEBRA_FIELD [MA - 1998 - SPRING - 16]

Each side of the given equation contains a term that needs to be distributed. Use the distributive property to simplify both sides of the equation. Consider only the left side of the equation. What do you get when you distribute 3 across $(x + 2)$?

(Problem ID: 14514) ALGEBRA_FIELD [MA - 1998 - SPRING - 16]

Now consider the right side of the equation only. What does 3 - (x + 1) become when you use the distributive property to remove the parentheses?

(Problem ID: 14515) RADIO_BUTTON [MA - 1998 - SPRING - 16]

Replace the left and right sides of the given equation with the equivalent expressions found in the previous two questions to find the correct equation. Which of the following equations could be the next step in solving the equation 3(x + 2) = 3 - (x + 1)?

4.) "Spring 2002, Grade 10, Algebra, Item 15 (2006/10/05 09:48:45)" (Problem ID: 13894) RADIO_BUTTON [MA - 2002 - Spring - 15]

No knowledge components have been assigned

Solve the following equation for x.

3x - (2x - 3) = 2x + 9

Answers: (Interface Type: RADIO_BUTTON)

✗ A. x = 6

✓ **B. x = -6**

✗ C. x = 11

✗ D. x = -11

(Problem ID: 13895) RADIO_BUTTON [MA - 2002 - Spring - 15]

You need to simplify the equation. Start by simplifying the left side. What does 3x - (2x - 3) simplify to?

(Problem ID: 13896) RADIO_BUTTON [MA - 2002 - Spring - 15]

The term 2x + 9 is as simplified as possible so now the equation is x + 3 = 2x + 9.
Get the x terms on the right side of the equation first. What is the equation when you subtract x from both sides?

(Problem ID: 13897) RADIO_BUTTON [MA - 2002 - Spring - 15]

Now bring the constants to the left side. Subtract 9 from both sides of the equation 3 = x + 9. What is x equal to?

5.) "Spring 2002, Grade 10, Algebra, Item 24 (2006/10/04 12:25:25)" (Problem ID: 13795) RADIO_BUTTON [MA - 2002 - SPRING - 24]

No knowledge components have been assigned

An important formula in statistics is $z = \frac{(x - \mu)}{\sigma}$. Which of the following represents this equation solved for x in terms of z, μ, and σ?

Answers: (Interface Type: RADIO_BUTTON)
✔ **A. x = zσ + μ**
✘ B. x = zσ - μ
✘ C. x = (z + μ)/σ
✘ D. x = (z - μ)/σ

(Problem ID: 13796) RADIO_BUTTON [MA - 2002 - SPRING - 24]
You need to isolate x on one side of the equation. What do you do to both sides to move σ to the left side?

(Problem ID: 13797) RADIO_BUTTON [MA - 2002 - SPRING - 24]
When you multiply both sides by σ the equation becomes σz = (x - μ). What do you do to both sides to move μ to the left side?

(Problem ID: 13876) RADIO_BUTTON [MA - 2002 - SPRING - 24]
The formula is $z = \frac{(x - \mu)}{\sigma}$. Which of the following represents this equation solved for x in terms of z, μ, and σ?

End Random Order Section Begin Random Order Section

6.) "14512 Hint Version (May 1998, gr. 10, no. 16)" (Problem ID: 15329) RADIO_BUTTON [MA - 1998 - SPRING - 16]
No knowledge components have been assigned
Which of the following could be the next step in solving the equation 3(x + 2) = 3 - (x + 1)?

Answers: (Interface Type: RADIO_BUTTON)
✔ **A. 3x + 6 = 3 - x - 1**
✘ B. 3x + 2 = 3 - x - 1
✘ C. 3x + 6 = 3 - x + 1
✘ D. 3x + 5 = 3 - x + 1

Hint 1:
If there were no variables in this equation, we would do the operations in the parentheses first (order of operations). However, we cannot simplify (x + 2) or (x + 1), so we need to use the distributive property as the next step. The distributive property is a(b + c) = ab + ac.
Hint 2:

You must use the distributive property on both sides of the equation to complete the next step. On the left side of the equation, distribute the 3 across (x + 2). On the right side of the equation, distribute the minus sign across (x + 1).
Hint 3:

$$3(x + 2)$$
$$3(x) + 3(2)$$
$$3x + 6$$

When you distribute the 3 across (x + 2), the left side of the equation becomes 3x + 6.
Hint 4:

$$3 - (x + 1)$$
$$3 + (-1)(x + 1)$$
$$3 + (-1)(x) + (-1)(1)$$
$$3 - x - 1$$

When you distribute the minus sign across (x + 1), the right side of the equation becomes 3 - x - 1.
Hint 5:
Now that you have completed the distribution on both sides of the equation, the equation becomes 3x + 6 = 3 - x - 1. Select this answer.

7.) "Spring 2002, Item 15, Hints (2006/10/05 09:48:45)" (Problem ID: 15396) RADIO_BUTTON [MA - 2002 - Spring - 15]

No knowledge components have been assigned
Solve the following equation for x.
3x - (2x - 3) = 2x + 9
Answers: (Interface Type: RADIO_BUTTON)
✗ A. x = 6
✓ **B. x = -6**
✗ C. x = 11
✗ D. x = -11

Hint 1:
Simplify the left side 3x - (2x - 3). Don't forget to distribute the "-" through.
Hint 2:
The expression simplifies as follows:
3x - 2x + 3
and combining like terms we get
x + 3
Hint 3:
The term 2x + 9 is as simplified as possible so now the equation is x + 3 = 2x + 9.
Get the x terms on the right side of the equation first:
-x + x + 3 = 2x - x + 9
3 = x + 9
Hint 4:
Now bring the constants to the left side. Subtract 9 from both sides of the equation 3 = x + 9:
-9 + 3 = x + 9 - 9

-6 = x. The answer is B. x = -6

8.) "Spring 2002, Item 24, Hints" (Problem ID: 15450) RADIO_BUTTON [MA - 2002 - SPRING - 24]

No knowledge components have been assigned

An important formula in statistics is $z = \frac{(x - \mu)}{\sigma}$.
Which of the following represents this equation solved for x in terms of z, μ, and σ?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. x = zσ + μ**
✗ B. x = zσ - μ
✗ C. x = (z + μ)/σ
✗ D. x = (z - μ)/σ

Hint 1:
You need to isolate x on one side of the equation. Multiply both sides by σ.
Hint 2:

$$\sigma z = \frac{(x - \mu)}{\sigma}\sigma$$

When you multiply both sides by σ the equation becomes what you see above or just σz = (x - μ). Next, add μ to both sides.
Hint 3:

$$\mu + \sigma z = x - \mu + \mu$$

After you add μ to both sides you get the above equation which is just x = zσ + μ. The answer is A. x = zσ + μ

End Random Order Section
End '{Problem}' Section Begin Random Order Section

9.) "2001_19_gr10_Response (2006/09/27 15:22:55)" (Problem ID: 13397) RADIO_BUTTON [MA - 2001 - Spring - 19]

No knowledge components have been assigned

Which could be the first step in simplifying the expression 2x -3(5x - 8)?

Answers: (Interface Type: RADIO_BUTTON)

✗ 2x – 15x + 8 *This is incorrect because the 8 is not multiplied by -3 but by -1.*
✗ 2x – 15x – 8 *This is incorrect because the 8 is not multiplied by -3.*
✗ 2x - 15x – 24 *This is incorrect because the negative is not distributed to the 24.*
✓ **2x – 15x + 24**

10.) "2000_3_10 (2006/10/30 22:20:06)" (Problem ID: 14436) RADIO_BUTTON

No knowledge components have been assigned

If 3(2r-5) = 27, then 2r-5 equals
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 30
✗ B. 24
✗ C. 81
✓ **D. 9**

(Problem ID: 14437) RADIO_BUTTON
No knowledge components have been assigned
Which of the following steps would we use to isolate 2r-5 on the left side of the equation?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14438) RADIO_BUTTON
No knowledge components have been assigned
We have followed these steps to isolate 2r-5.

3(2r-5)=27

3(2r-5)/3=27/3

(2r-5)=27/3

Now which of the following, original answers is the value of 2r-5

Answers: (Interface Type: RADIO_BUTTON)

11.) "Spring_2000_11" (Problem ID: 12937) ALGEBRA_FIELD [MA - 2000 - Spring - 11]
No knowledge components have been assigned
Solve the following equation for x

0.5(x - 8) = 0.2x + 11
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **x=50**
✓ **50**

(Problem ID: 12941) ALGEBRA_FIELD [MA - 2000 - Spring - 11]
No knowledge components have been assigned
First, let's make things easier by simplifying the left side of the equation. What do you get when you multiply out 0.5(x-8)?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 12942) ALGEBRA_FIELD [MA - 2000 - Spring - 11]
No knowledge components have been assigned
EXCELLENT!!! We are almost done with this problem. After distributing successfully on the left side, the equation should now read 0.5x-4 = 0.2x+11. What is the value of x?

Answers: (Interface Type: ALGEBRA_FIELD)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

12.) "pre_2000_12_10" (Problem ID: 15679) ALGEBRA_FIELD [MA - 2000 - Spring - 12]

No knowledge components have been assigned

What is the missing term in the quadratic expression below?

$(2x - 3)(x + 4) = 2x^2 + \_\_\_ - 12$

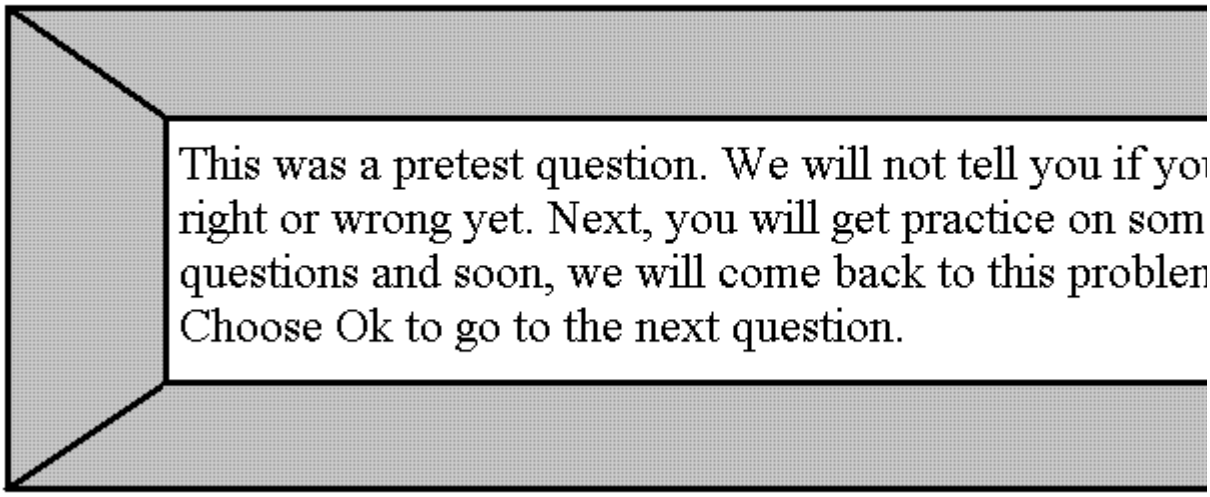
Answers: (Interface Type: ALGEBRA_FIELD)

✔ **5x**

(Problem ID: 15680) RADIO_BUTTON [MA - 2000 - Spring - 12]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.

Answers: (Interface Type: RADIO_BUTTON)

13.) "pre_2005_3_10" (Problem ID: 15682) TEXT_FIELD [MA - 2005 - SPRING - 3]

No knowledge components have been assigned

A fast-growing strain of bacteria doubles in population every 20 minutes. A laboratory has a culture of 200 of these bacteria cells. The function below can be used to find p, the number of bacteria cells in this culture after t **hours**.

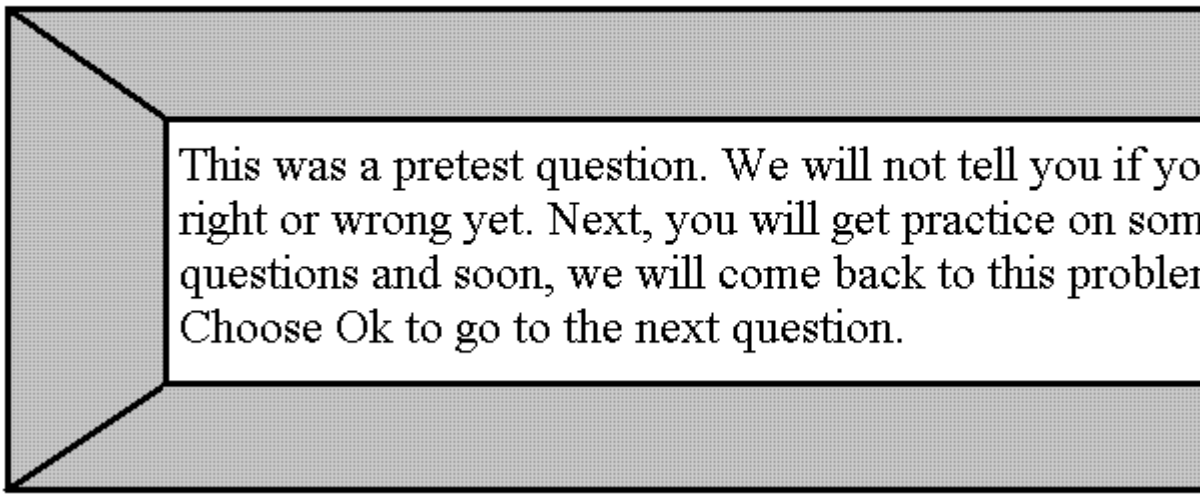
$p = 200(\ 8^t\ )$

What is the total number of bacteria cells after 2 hours?

Answers: (Interface Type: TEXT_FIELD)
✓ **12,800**
✓ **12800**

(Problem ID: 15683) RADIO_BUTTON [MA - 2005 - SPRING - 3]
No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

14.) "spring 2001 gr 10 no 14" (Problem ID: 13029) RADIO_BUTTON [MA - 2001 - Spring - 14]
No knowledge components have been assigned
Which values of x satisfy the following equation?

$x^2 + 2x - 15 = 0$

Answers: (Interface Type: RADIO_BUTTON)
✗ A. x = 5 and x = 3
✓ **B. x = -5 and x = 3**
✗ C. x = 15 and x = -1
✗ D. x = 5 and x = -3

(Problem ID: 13030) RADIO_BUTTON [MA - 2001 - Spring - 14]
The best way to solve a quadratic equation is to factor it. The factors will take the form (x ? a)*(x ? b). We need to find out what a and b are such that a*b = -15 and a + b = 2. What are a and b?

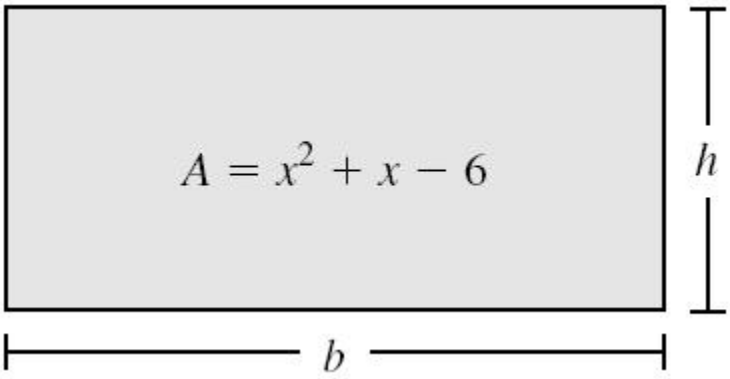
(Problem ID: 13031) RADIO_BUTTON [MA - 2001 - Spring - 14]

The factored equation for $x^2 + 2x - 15 = 0$ now becomes $(x + 5)*(x - 3) = 0$. What are the values of x that satisfy this equation?

15.) "spring 2006 gr 10 no. 6" (Problem ID: 13118) RADIO_BUTTON [MA - 2006 - SPRING - 6]

Knowledge components:

Transfermodel	Knowledge Component
106-KC Transfer Model Created by WPI for 8th Grade Math	Area



A rectangle and an equation representing its area, A, are shown above. Which of the following could represent b, the length of the base of the rectangle, and h, the height of the rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✘ A. b = (x - 3); h = (x - 2)
✘ B. b = (x - 3); h = (x + 2)
✘ C. b = (x + 3); h = (x + 2)
✓ **D. b = (x + 3); h = (x - 2)**

(Problem ID: 13119) RADIO_BUTTON [MA - 2006 - SPRING - 6]

The figure gives the dimensions and area of the rectangle, which can be represented by the equation $h*b = x^2 + x - 6$. Since there are only four possibilities, it is easy to check each one to see if it works. Take b = (x-3) and h = (x-2), what is the product h*b?

(Problem ID: 13120) RADIO_BUTTON [MA - 2006 - SPRING - 6]

Since $x^2 - 5x + 6 \neq x^2 + x - 6$, this set of dimensions is not the correct one. Repeat the same process for the remaining possibilities. Which of the following choices represents the given rectangle?

16.) "Fall 2002 retest gr 10 no 23" (Problem ID: 14908) RADIO_BUTTON

No knowledge components have been assigned

Ms. Gill told her students to draw a rectangle with these properties.

- The length is 3 inches longer than the width.
- The area is 40 square inches.

What is the width of this rectangle?

Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 5 inches**
✗ B. 8 inches
✗ C. 8.5 inches
✗ D. 10 inches

(Problem ID: 14909) ALGEBRA_FIELD

The problem describes the relative dimensions of a rectangle with an area of 40 square inches. The length is given in terms of the width, which is unknown. We need to clearly define both the length and the width before we can solve for the actual value of the width. Let's start by defining the width as the variable "x." If the width is x, then what is the length of the rectangle in terms of x? (Do not type in any units.)

(Problem ID: 14913) RADIO_BUTTON

Now that we know expressions for the dimensions of the rectangle, we can use the fact that the area equals 40 square inches to set up an equation that can be solved to find the actual width of the rectangle. Which of these equations is the correct way to calculate the area of this rectangle?

(Problem ID: 15097) RADIO_BUTTON

We now have an equation that can be solved to find x, the width of the rectangle. However, in order to directly solve for x we would need to simplify x*(x + 3) = 40, set it equal to zero and factor it, which is a lot of work. It is easier to just use the guess and check method at this point. The problem gives four possible values for the width of the rectangle (x), so just try substituting each of these values into the expression x*(x + 3). The value of x that makes the equation x*(x + 3) = 40 true is the correct width of the rectangle. What is the width of the rectangle?

17.) "November 2005 re-test, Grade 10, Algebra, Item 35 (2006/09/26 15:09:35)" (Problem ID: 13340) RADIO_BUTTON [MA - 2005 - NOVEMBER - 35]

No knowledge components have been assigned

A laboratory has a 75-gram sample of a radioactive material. The half-life of the material is 10 days. (This means that it takes 10 days for half of the initial mass to decay.) The formula below can be used to find m, the remaining mass in grams, in terms of t, the number of 10 day intervals the mass has been decaying.

$m = 75(0.5)^t$

Based on the formula, what is the mass of the laboratory's sample remaining after 30 days?

Answers: (Interface Type: RADIO_BUTTON)
✓ **A. 9.375 grams**
✗ B. 11.25 grams
✗ C. 12.5 grams

✗ D. 22.5 grams

(Problem ID: 13342) ALGEBRA_FIELD [MA - 2005 - NOVEMBER - 35]
Lets start by determining which value of t we must substitute into the equation $m = 75(0.5)^t$ in order to find m. What is the value of t for 30 days?

(Problem ID: 13343) RADIO_BUTTON [MA - 2005 - NOVEMBER - 35]
Now use t = 3 to determine the mass after 30 days. What is the mass after 30 days?

18.) "march 2006 retest gr 10 no 34" (Problem ID: 13529) RADIO_BUTTON

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

$(x + 2)(x - 3)$

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. $x^2 - x - 6$**
✗ B. $x^2 + 5x - 6$
✗ C. $x^2 - x - 5$
✗ D. $x^2 + 5x - 5$

(Problem ID: 13530) RADIO_BUTTON
To find the equivalent expression for the given expression, you must take the first term in the first set of parenthesis, x, and multiply it by each term in the second set of parenthesis, (x - 3). What is this product?

(Problem ID: 13531) RADIO_BUTTON
Now multiply the second term in the first set of parenthesis, 2, by each term in the second set of parenthesis, (x - 3). What is this product?

(Problem ID: 13532) RADIO_BUTTON
Combine the results from the previous two questions to find an equivalent expression for the given expression. What is this equivalent expression?

19.) "Spring 2006 gr 10 no 24" (Problem ID: 13416) RADIO_BUTTON [MA - 2006 - SPRING - 24]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

$(x + 5)(2x - 3)$

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. $2x^2 + 7x - 15$**
✗ B. $2x^2 - 7x - 15$
✗ C. $3x^2 + 7x - 15$
✗ D. $3x^2 - 7x - 15$

(Problem ID: 13417) RADIO_BUTTON [MA - 2006 - SPRING - 24]
In order to solve this problem, you must multiply the first term (x+5) by the second term (2x-3). The first thing to do is distribute the x from (x+5) across (2x-3). What is x(2x-3)?

(Problem ID: 13418) RADIO_BUTTON [MA - 2006 - SPRING - 24]
The next step is to distribute the 5 in (x+5) across (2x-3). What is 5(2x-3)?

(Problem ID: 13419) RADIO_BUTTON [MA - 2006 - SPRING - 24]
Now you must combine these two results to get the final expression. Which of the following expressions is equivalent to (x+5)(2x-3)?

20.) "march 2006 retest gr 10 no 4" (Problem ID: 13441) RADIO_BUTTON

No knowledge components have been assigned

What is the factored form of the expression below?

$x^2 - 16$

Answers: (Interface Type: RADIO_BUTTON)
✓ **A. (x - 4)(x + 4)**
✗ B. (x - 8)(x + 8)
✗ C. (x - 4)(x - 4)
✗ D. (x - 8)(x - 8)

(Problem ID: 13442) ALGEBRA_FIELD
Since this expression is the difference of two squares and there is no middle term, when factored, $x^2 - 16$ will take the form of (__ + ?)(__ - ?), where the two question marks represent the same number. What number should replace the question marks?

(Problem ID: 13443) RADIO_BUTTON
Given that the factored expression of $x^2 - 16$ must take the form (__ + 4)(__ - 4), simply look at the four choices to find the one that takes this form. Which of the possibilities below meets this requirement?

End Random Order Section Begin Random Order Section

21.) "13029 Hint Version (spring 2001 gr 10 no 14)" (Problem ID: 15361) RADIO_BUTTON

No knowledge components have been assigned

Which values of x satisfy the following equation?

$x^2 + 2x - 15 = 0$

Answers: (Interface Type: RADIO_BUTTON)
✗ A. x = 5 and x = 3
✓ **B. x = -5 and x = 3**
✗ C. x = 15 and x = -1
✗ D. x = 5 and x = -3

Hint 1:
The best way to solve a quadratic equation is to factor it. The factors will take the form (x ? *a*) (x ? *b*). For the equation $x^2 + 2x - 15 = 0$, we need to find *a* and *b* such that *a***b* = -15 and *a* + *b* = 2.
Hint 2:
a = 5
b = -3

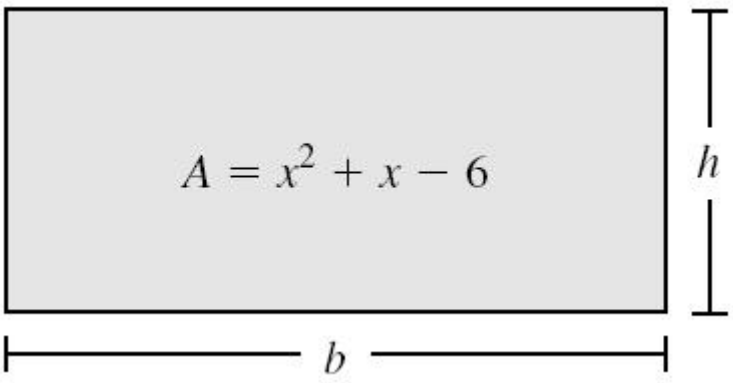
*a***b* = (5)(-3) = -15
a + *b* = 5 + (-3) = 2

The values of *a* and *b* that satisfy both equations are *a* = 5 and *b* = -3.
Hint 3:
The factored equation for $x^2 + 2x - 15 = 0$ now becomes (x + 5)(x - 3) = 0. You need to find the values of x that satisfy this equation.
Hint 4:
In order to solve an equation like (x + 5)(x - 3) = 0, you must find the values of x that make (x + 5) = 0 or (x - 3) = 0.
Hint 5:
The values of x that make (x + 5) = 0 or (x - 3) = 0 are x = -5 and x = 3, respectively.

Select the answer x = -5 and x = 3.

22.) "13118 Hint Version (spring 2006 gr 10 no. 6)" (Problem ID: 15449) RADIO_BUTTON [MA - 2006 - SPRING - 6]

No knowledge components have been assigned



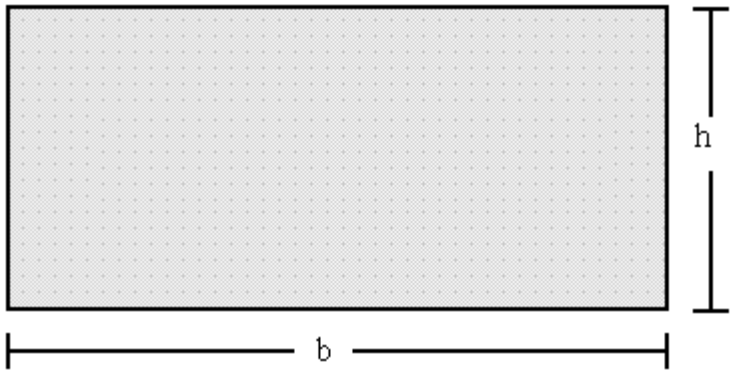
A rectangle and an equation representing its area, A, are shown above. Which of the following could represent b, the length of the base of the rectangle, and h, the height of the rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. b = (x - 3); h = (x - 2)
✗ B. b = (x - 3); h = (x + 2)
✗ C. b = (x + 3); h = (x + 2)
✓ **D. b = (x + 3); h = (x - 2)**

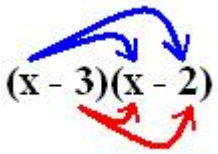
Hint 1:
The figure gives the dimensions and area of the rectangle, which can be represented by the equation h*b = x^2 + x - 6. Since there are only four possibilities, it is easy to check each one to see if it works. Starting with choice A, take b = (x-3) and h = (x-2) and find the product h*b.

Hint 2:



The area equals the base (x - 3) multiplied by the height (x - 2).

Hint 3:



Think about how you multiply (x - 3) by (x - 2).

Hint 4:

(x - 3)(x - 2)

(x - 3)*(x - 2) = x^2 - 5x + 6

Since x^2 - 5x + 6 does not equal x^2 + x - 6, this choice is not correct. Repeat this process for the remaining choices to find the correct choice.

Hint 5:

(x - 3)*(x + 2)
x^2 + 2x - 3x - 6
x^2 - x - 6
x^2 - x - 6 ≠ x^2 + x - 6

(x + 3)*(x + 2)
x^2 + 2x + 3x + 6
x^2 + 5x + 6
x^2 + 5x + 6 ≠ x^2 + x - 6

(x + 3)*(x -
x^2 - 2x + 3x
x^2 + x - 6
x^2 + x - 6 = x^2 +

The correct base and height of the rectangle are b = (x + 3) and h = (x - 2). Select this answer.

23.) "14908 Hints Version (Fall 2002 retest gr 10 no 23)" (Problem ID: 15454) RADIO_BUTTON [MA - 2002 - FALL - 23]

No knowledge components have been assigned

Ms. Gill told her students to draw a rectangle with these properties.

- The length is 3 inches longer than the width.
- The area is 40 square inches.

What is the width of this rectangle?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 5 inches**
✗ B. 8 inches
✗ C. 8.5 inches
✗ D. 10 inches

Hint 1:
The problem describes the relative dimensions of a rectangle with an area of 40 square inches. The length is given in terms of the width, which is unknown. We need to clearly define both the length and the width before we can solve for the actual value of the width. Let's start by defining the width as the variable x. If the width is x, then the length is x + 3.

Hint 2:
Now that we know expressions for the dimensions of the rectangle, we can use the fact that the area equals 40 square inches to set up an equation that can be solved to find the actual width of the rectangle.

The length of the rectangle is x + 3, and the width of the rectangle is x. Multiply x by x + 3 to find the area of this rectangle. Remember that the problem states that the area is 40 square inches, so x*(x + 3) will equal 40 square inches.

The equation that correctly shows how to calculate the area of this rectangle is x*(x + 3) = 40.

Hint 3:
We now have an equation that can be solved to find x, the width of the rectangle. However, in order to directly solve for x we would need to simplify x*(x + 3) = 40, set it equal to zero and factor it, which is a lot of work. It is easier to just use the guess and check method at this point. The problem gives four possible values for the width of the rectangle (x), so just try substituting each of these values into the expression x*(x + 3). The value of x that makes the equation x*(x + 3) = 40 true is the correct width of the rectangle.

Hint 4:

You can choose any of the four answers and substitute it into the expression for x. If the expression equals 40 when you simplify it, the answer you chose is correct. Let's start by trying 8 inches.

$x*(x + 3)$ where $x = 8$

$8*(8 + 3)$

$8*(11)$

88

Since $88 \neq 40$, the width of the rectangle is not 8 inches. Try substituting another value into the expression $x*(x + 3)$. The value of x that makes this expression equal 40 is the correct width of the rectangle.

false

Hint 5:

$x = 5$	$x = 8.5$	$x = 10$
$x*(x + 3)$	$x*(x + 3)$	$x*(x + 3)$
$5*(5 + 3)$	$8.5*(8.5 + 3)$	$10*(10 + 3)$
$5*(8)$	$8.5*(11.5)$	$10*(13)$
40	97.75	130
$40 = 40$	$97.75 \neq 40$	$130 \neq 40$

Since the equation $x*(x + 3) = 40$ is only true when $x = 5$, the width of the rectangle must be 5 inches. Select this answer.

24.) "November 2005, Item 35, Hints" (Problem ID: 15455) RADIO_BUTTON [MA - 2005 - NOVEMBER - 35]

No knowledge components have been assigned

A laboratory has a 75-gram sample of a radioactive material. The half-life of the material is 10 days. (This means that it takes 10 days for half of the initial mass to decay.) The formula below can be used to find m, the remaining mass in grams, in terms of t, the number of 10 day intervals the mass has been decaying.

$m = 75(0.5)^t$

Based on the formula, what is the mass of the laboratory's sample remaining after 30 days?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 9.375 grams**

✗ B. 11.25 grams

✗ C. 12.5 grams

✗ D. 22.5 grams

Hint 1:

Start by determining which value of t you must substitute into the equation $m = 75(0.5)^t$ in order to find m. Find the value of t for 30 days.

Hint 2:

t is the number of 10-day intervals. There are three 10-day intervals in 30 days so $t = 3$.

Hint 3:
Now use t = 3 to determine the mass after 30 days.
$m = 75(0.5)^3$. Use your calculator.
Hint 4:
$m = 75(0.5)^3 = 9.375$ grams. The answer is A

25.) "13529 Hint Version (march 2006 retest gr 10 no 34)" (Problem ID: 15356) RADIO_BUTTON [MA - 2006 - MAR - 34]

No knowledge components have been assigned
Which of the following is equivalent to the expression below?

$(x + 2)(x - 3)$

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. $x^2 - x - 6$**
✗ B. $x^2 + 5x - 6$
✗ C. $x^2 - x - 5$
✗ D. $x^2 + 5x - 5$

Hint 1:
To find the correct equivalent expression, you have to distribute the terms in the first set of parentheses across the terms in the second set of parentheses. Start by distributing the x from (x + 2) across (x - 3). Then distribute the 2 from (x + 2) across (x - 3). Finally combine these results.
Hint 2:

$$(x + 2)(x - 3)$$

When you distribute x across (x - 3), you get $x^2 - 3x$.
Hint 3:

$$(x + 2)(x - 3)$$

$x^2 - 3x$

When you distribute 2 across (x - 3), you get $2x - 6$.
Hint 4:

$$x^2 - 3x + 2x - 6 = x^2 - x - 6$$

Adding the previous results together and combining like terms yields the result $x^2 - x - 6$. Select this answer.

26.) "13416 Hint Version (Spring 2006 gr 10 no 24)" (Problem ID: 15357) RADIO_BUTTON [MA - 2006 - SPRING - 24]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

$(x + 5)(2x - 3)$

Answers: (Interface Type: RADIO_BUTTON)

✔ **A. $2x^2 + 7x - 15$**

✘ B. $2x^2 - 7x - 15$

✘ C. $3x^2 + 7x - 15$

✘ D. $3x^2 - 7x - 15$

Hint 1:

In order to solve this problem, you must multiply the first term (x+5) by the second term (2x-3). The first thing to do is distribute the x from (x+5) across (2x-3). The next thing to do is to distribute the 5 from (x+5) across (2x-3). Finally, you need to combine these results.

Hint 2:

Distribute the x.

$$(x + 5)(2x - 3)$$

$x(2x) + x(-3) = 2x^2 - 3x$

When you distribute the x from (x+5) across (2x-3), the result is $2x^2 - 3x$.

Hint 3:

Distribute the 5.

$$(x + 5)(2x - 3)$$

$$2x^2 - 3x$$

$5(2x) + 5(-3) = 10x - 15$

When you distribute the 5 from (x+5) across (2x-3), the result is 10x - 15.
Hint 4:
$2x^2 - 3x + 10x - 15 = 2x^2 + 7x - 15$

You now must add these results and combine like terms to obtain the final answer of $2x^2 + 7x - 15$. Select this answer.

27.) "13441 Hint Version (march 2006 retest gr 10 no 4)" (Problem ID: 15360) RADIO_BUTTON [MA - 2006 - MAR - 4]

No knowledge components have been assigned
What is the factored form of the expression below?

$x^2 - 16$

Answers: (Interface Type: RADIO_BUTTON)
✓ **A. (x - 4)(x + 4)**
✗ B. (x - 8)(x + 8)
✗ C. (x - 4)(x - 4)
✗ D. (x - 8)(x - 8)

Hint 1:
Since this expression is the difference of two squares and there is no middle term, when factored, $x^2 - 16$ will take the form of (x + ?)(x - ?), where the two question marks represent the same number.
Hint 2:
The number that replaces the question marks must equal -16 when it is multiplied by the negative of itself.
Hint 3:
(4)(-4) = -16
The number that belongs in the place of the question marks is 4.
Hint 4:
The factored form of the expression is (x - 4)(x + 4). Select this answer.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

28.) "2001_28R_gr10_scaffold (2006/09/27 21:14:17)" (Problem ID: 13485) RADIO_BUTTON [MA - 2001 - FALL - 28]

No knowledge components have been assigned

$$t = \frac{\sqrt{d}}{4} + \frac{d}{1100}$$

The formula above is used to calculate the number of seconds, t, it takes to hear a splash after dropping an object into a well that is d feet deep. Which is closest to the number of seconds it takes to hear a splash after dropping an object into a well that is 200 feet deep?
Answers: (Interface Type: RADIO_BUTTON)
✓ **3.72**

✗ 3.55
✗ 7.25
✗ 50.18

(Problem ID: 13498) RADIO_BUTTON [MA - 2001 - FALL - 28]

No knowledge components have been assigned

$$t = \frac{\sqrt{200}}{4} + \frac{200}{1100}$$

When 200 is substituted in for d we get the equation above. What is t?

Answers: (Interface Type: RADIO_BUTTON)

29.) "Spring_2000_12" (Problem ID: 13696) RADIO_BUTTON [MA - 2000 - Spring - 12]

No knowledge components have been assigned

What is the missing term in the quadratic expression below?

$(2x - 3)(x + 4) = 2x^2 + \_\_\_ - 12$

Answers: (Interface Type: RADIO_BUTTON)

✓ **A) 5x**
✗ B) 11x
✗ C) 3x
✗ D) 9x

(Problem ID: 13697) RADIO_BUTTON [MA - 2000 - Spring - 12]

No knowledge components have been assigned

Let's begin by simplifying the left side of the equation. What do you get when you multiply out the terms in parenthesis?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14389) RADIO_BUTTON [MA - 2000 - Spring - 12]

No knowledge components have been assigned

So now, lets go back to the original question. What is the missing term in the quadratic expression $(2x - 3)(x + 4) = 2x^2 + \_\_\_ - 12$

Answers: (Interface Type: RADIO_BUTTON)

30.) "Spring_2005_3" (Problem ID: 14757) RADIO_BUTTON

No knowledge components have been assigned

A fast-growing strain of bacteria doubles in population every 20 minutes. A laboratory has a culture of 200 of these bacteria cells. The function below can be used to find p, the number of bacteria cells in this culture after t **hours**.

$p = 200(\ 8^t\ )$

Which of the following is closest to the total number of bacteria cells after 2 hours?
Answers: (Interface Type: RADIO_BUTTON)
✗ A) 3,200
✓ **B) 12,800**
✗ C) 51,200
✗ D) 2,560,000

(Problem ID: 14758) RADIO_BUTTON

No knowledge components have been assigned

An equation is given to find the number of bacteria cells p as a function of the total number of hours passed t. You are given that $t = 2$ hours. What should be your first step after substituting in 2 for t?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14759) RADIO_BUTTON

No knowledge components have been assigned

Great! Now that you correctly simplified the exponential term you are ready to solve for p. What is the value of p?
Answers: (Interface Type: RADIO_BUTTON)

31.) "May 1998 gr 10 no 25" (Problem ID: 14516) RADIO_BUTTON [MA - 1998 - SPRING - 25]

No knowledge components have been assigned

If the area of a rectangle is $8x^2 - 12x$, the dimensions of the rectangle could be...
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 2x and (x - 3).
✗ B. 4x and x.
✓ **C. 4x and (2x - 3).**
✗ D. 4x and (x - 3).

(Problem ID: 14517) RADIO_BUTTON [MA - 1998 - SPRING - 25]

No knowledge components have been assigned

Remember that the area of a rectangle equals the base multiplied by the height, so the dimensions must equal $8x^2 - 12x$ when multiplied by one another. Since there are only four possibilities, we can check each one to see if it meets the requirement. Start with choice A, 2x and (x - 3). What would the area of this rectangle be?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14518) RADIO_BUTTON [MA - 1998 - SPRING - 25]

No knowledge components have been assigned

Since $2x^2 - 6x \neq 8x^2 - 12x$, this set of dimensions is not the correct one. Repeat the same process for the remaining possibilities. Which of the following could be the dimensions of a rectangle with an area of $8x^2 - 12x$?
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

32.) "pre_2004_10_10_R" (Problem ID: 15685) RADIO_BUTTON [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

(3x + 6y) + (2x - y)

Answers: (Interface Type: RADIO_BUTTON)

✗ A) 5x - y
✗ B) 5x + 7y
✗ C) 6x - 6y
✓ **D) 5x + 5y**

(Problem ID: 15686) RADIO_BUTTON [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Pretest Question

This was a pretest question. We will not tell you if yc
right or wrong yet. Next, you will get practice on son
questions and soon, we will come back to this proble
Choose Ok to go to the next question.

Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.

Answers: (Interface Type: RADIO_BUTTON)

33.) "pre_2004_27_10_R" (Problem ID: 15689) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

$$\frac{24x^2 - 40x^3}{8x}$$

For all values of *x* other than zero, which of the following expressions is equivalent to the one shown above?

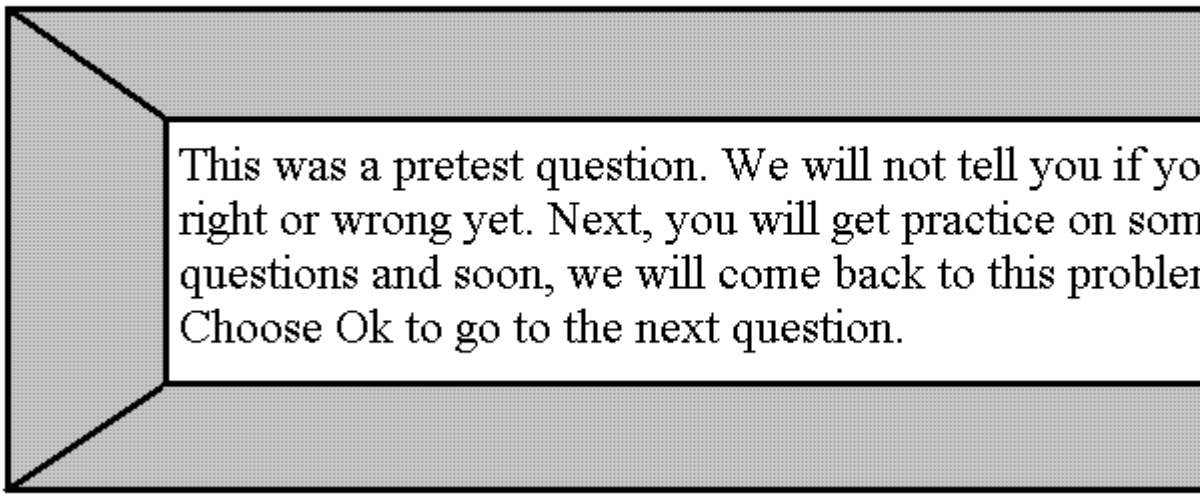
Answers: (Interface Type: RADIO_BUTTON)

✓ **A) $3x - 5x^2$**

✗ B) $3x - 40x^2$
✗ C) $-2x^2$
✗ D) $-16x^2$

(Problem ID: 15690) RADIO_BUTTON [MA - 2004 - NOV - 27]
No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

34.) "march 2006 retest gr 10 no 6" (Problem ID: 13448) RADIO_BUTTON [MA - 2006 - MAR - 6]
No knowledge components have been assigned
Which of the following is equivalent to the expression below?

$(3ab^2)^3$

Answers: (Interface Type: RADIO_BUTTON)
✗ A. $3a^3b^5$
✗ B. $3a^3b^6$
✗ C. $9a^3b^6$
✓ **D. $27a^3b^6$**

(Problem ID: 13449) ALGEBRA_FIELD [MA - 2006 - MAR - 6]
The expression $(3ab^2)^3$ is equivalent to the expression $(3ab^2)(3ab^2)(3ab^2)$, which can be solved by multiplying like terms together separately and then combining them into the final result. For example, $a*a*a = a^3$. Now what is the value of 3*3*3?

(Problem ID: 13455) RADIO_BUTTON [MA - 2006 - MAR - 6]

Now consider the variable b. What is the value of $b^2*b^2*b^2$?

(Problem ID: 13456) RADIO_BUTTON [MA - 2006 - MAR - 6]

Combine the results from the first two questions, 27, a^3 and b^6, into one expression. What is this equivalent expression?

35.) "march 2006 retest gr 10 no 40" (Problem ID: 13552) RADIO_BUTTON [MA - 2006 - MAR - 40]

No knowledge components have been assigned

$$\frac{15x^2 + 6x}{3x}$$

If x is not equal to 0, which of the following is equivalent to the expression above?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 7x

✗ B. 11x

✓ **C. 5x + 2**

✗ D. $15x^2 + 2$

(Problem ID: 13554) RADIO_BUTTON [MA - 2006 - MAR - 40]

The denominator 3x must be divided into each term of the numerator $15x^2 + 6x$ separately. What do you get when you divide the first term $15x^2$ by 3x?

(Problem ID: 13555) RADIO_BUTTON [MA - 2006 - MAR - 40]

Next divide the second term in the numerator, 6x, by the denominator, 3x. What is the result?

(Problem ID: 13556) RADIO_BUTTON [MA - 2006 - MAR - 40]

Combine the results from the first two questions to find the correct equivalent expression. Which expression is the correct equivalent expression?

36.) "November 2005 re-test, Grade 10, Algebra, Item 32, Hints (2006/09/26 10:26:28)" (Problem ID: 13332) RADIO_BUTTON [MA - 2005 - NOVEMBER - 32]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

$(x^2 - 3x + 1) - (4x - 2)$

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $x^2 - 7x - 1$

✓ **B. $x^2 - 7x + 3$**

✗ C. $-3x^2 - 3x + 3$

✗ D. $x^2 + 12x + 2$

Hint 1:
Distribute the "-" through the (4x - 2) term.
Hint 2:
The sign of 4x and -2 change when they get multiplied by "-"
Hint 3:
After distributing the "-" through (4x - 2) you get $x^2 - 3x + 1 - 4x + 2$. Combine the like terms to get the answer.
Hint 4:
First combine the 'x' terms:
$x^2 - 3x + 1 - 4x + 2$
$x^2 - 7x + 1 + 2$
Hint 5:
Next combine the constant terms:
$x^2 - 7x + 1 + 2$
$x^2 - 7x + 3$
Hint 6:
The answer is B. $x^2 - 7x + 3$

End Random Order Section Begin Random Order Section

37.) "13448 Hint Version (march 2006 retest gr 10 no 6)" (Problem ID: 15364) RADIO_BUTTON [MA - 2006 - MAR - 6]

No knowledge components have been assigned
Which of the following is equivalent to the expression below?

$(3ab^2)^3$

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $3a^3b^5$

✗ B. $3a^3b^6$

✗ C. $9a^3b^6$

✓ **D. $27a^3b^6$**

Hint 1:
The expression $(3ab^2)^3$ is equivalent to the expression $(3ab^2)(3ab^2)(3ab^2)$, which can be solved by multiplying like terms together separately and then combining them into the final result. For example, consider only the 3's, and you obtain 3*3*3 = 27. Repeat this for the a's and b's.
Hint 2:
$a*a*a = a^3$
Moving onto the a's, you obtain a result of a^3.
Hint 3:
$b^2*b^2*b^2 = b*b*b*b*b*b$
$b*b*b*b*b*b = b^6$
Moving onto the b's, you obtain a result of b^6.

Hint 4:
Combining the terms 27, a^3 and b^6 yields the expression $27*a^3*b^6$.

The correct equivalent expression is $27a^3b^6$. Select this answer.

38.) "13552 Hint Version (march 2006 retest gr 10 no 40)" (Problem ID: 15365) RADIO_BUTTON [MA - 2006 - MAR - 40]

No knowledge components have been assigned

$$\frac{15x^2 + 6x}{3x}$$

If x is not equal to 0, which of the following is equivalent to the expression above?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 7x
✗ B. 11x
✓ **C. 5x + 2**
✗ D. $15x^2 + 2$

Hint 1:
The denominator 3x must be divided into each term of the numerator $15x^2 + 6x$ separately. The results can then be added together to obtain the final answer.
Hint 2:

Start by dividing the $15x^2$ by 3x.

Instead of thinking about it like $\frac{15x^2}{3x}$, think about it like $\frac{15x^2}{3x} = \left(\frac{15}{3}\right)\left(\frac{x^2}{x}\right)$.

$$\frac{15x^2}{3x} = \left(\frac{15}{3}\right)\left(\frac{x^2}{x}\right) = (5)\left(\frac{xx}{x}\right) = (5x)\left(\frac{x}{x}\right) = (5x)(1) = 5x$$

false
Hint 3:

Next divide the second term in the numerator, 6x, by the denominat

Instead of thinking about it like $\frac{6x}{3x}$, think about it like $\frac{6x}{3x} = \left(\frac{6}{3}\right)\left(\frac{x}{x}\right)$.

$$\frac{6x}{3x} = \left(\frac{6}{3}\right)\left(\frac{x}{x}\right) = (2)(1) = 2$$

false
Hint 4:
Combine the results from the first two questions, 5x and 2. The correct equivalent expression is 5x + 2. Select this answer.

39.) "November 2005 re-test, Grade 10, Algebra, Item 32 (2006/09/26 10:26:28)" (Problem ID: 15391) RADIO_BUTTON [MA - 2005 - NOVEMBER - 32]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

$(x^2 - 3x + 1) - (4x - 2)$

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $x^2 - 7x - 1$

✓ **B. $x^2 - 7x + 3$**

✗ C. $-3x^2 - 3x + 3$

✗ D. $x^2 + 12x + 2$

(Problem ID: 15392) RADIO_BUTTON [MA - 2005 - NOVEMBER - 32]

First we need to distribute the "-" through the (4x - 2) term. What does the expression $(x^2 - 3x + 1) - (4x - 2)$ look like after you distribute the "-" through?

(Problem ID: 15393) RADIO_BUTTON [MA - 2005 - NOVEMBER - 32]

Now combine like terms. What does the expression $x^2 - 3x + 1 - 4x + 2$ become when you combine all the like terms?

End Random Order Section

End '{Problem}' Section Begin Random Order Section

40.) "November_2004_Retake_10" (Problem ID: 14653) RADIO_BUTTON [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

(3x + 6y) + (2x - y)

Answers: (Interface Type: RADIO_BUTTON)

✗ A) 5x - y

✗ B) 5x + 7y

✗ C) 6x - 6y

✓ **D) 5x + 5y**

(Problem ID: 14654) ALGEBRA_FIELD [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

We can easily simplify the above expression by combining like terms. What do you get when you combine the x terms, 3x and 2x?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 14655) ALGEBRA_FIELD [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Now let's do some more simplifying by combining y terms. What do you get after combining the y terms?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 14656) RADIO_BUTTON [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Great! Now you can answer the original question. What did
(3x + 6y) + (2x - y) simplify to?

Answers: (Interface Type: RADIO_BUTTON)

41.) "November_2004_Retake_27" (Problem ID: 15219) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

$$\frac{24x^2 - 40x^3}{8x}$$

For all values of *x* other than zero, which of the following expressions is equivalent to the one shown above?

Answers: (Interface Type: RADIO_BUTTON)

✔ **A) $3x - 5x^2$**

✘ B) $3x - 40x^2$

✘ C) $-2x^2$

✘ D) $-16x^2$

(Problem ID: 15220) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

To solve this problem, all we must do is simplify the above expression. To do this, we must reduce the numerator and the denominator by a common factor. What is the greatest common factor by which we can reduce all three terms ($24x^2$, $-40x^3$, $8x$) ?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 15221) ALGEBRA_FIELD [MA - 2004 - NOV - 27]

No knowledge components have been assigned

Great! Now that we have established the greatest common factor between the 3 terms, let's do some reducing! Let's start with the term $24x^2$. How does this term reduce when you factor out 8x?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 15222) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

Marvelous! Now let's do the same for the next term, $-40x^3$. How does this term reduce when 8x is factored out?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 15241) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

$$\frac{24x^2 - 40x^3}{8x}$$

Now we are ready to answer the original question. For all values of *x* other than zero, which of the following expressions is equivalent to the one shown above?
Answers: (Interface Type: RADIO_BUTTON)

42.) "November_2004_Retake_22" (Problem ID: 14649) RADIO_BUTTON [MA - 2004 - NOVEMBER - 22]

No knowledge components have been assigned

An algebraic expression is shown below.

$(x^4y^2z)(xy^3z^2)$

Which of the following is equivalent to the expression shown?
Answers: (Interface Type: RADIO_BUTTON)

✗ A) $x^4y^6z^2$
✗ B) $x^4y^5z^2$
✗ C) x^5y^6z
✓ **D) $x^5y^5z^3$**

(Problem ID: 14650) RADIO_BUTTON [MA - 2004 - NOVEMBER - 22]

No knowledge components have been assigned

Let's try this one step at a time. What do you get when you multiply $x^4 * x$?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14651) RADIO_BUTTON [MA - 2004 - NOVEMBER - 22]

No knowledge components have been assigned

Now let's try the same for y. What do you get when you multiply $y^2 * y^3$?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14652) RADIO_BUTTON [MA - 2004 - NOVEMBER - 22]

No knowledge components have been assigned

Now do the same for z. What do you get for a final solution when you combine our answers for x, y and z?
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

43.) "pre_2004_27_10" (Problem ID: 15694) TEXT_FIELD [MA - 2004 - Spring - 27]

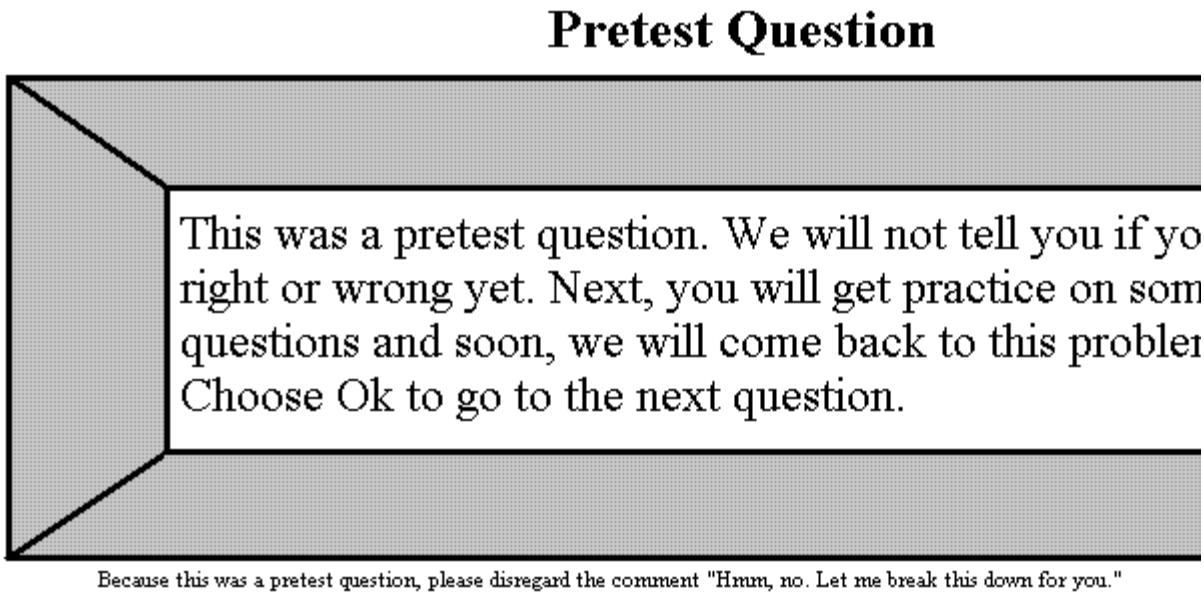
No knowledge components have been assigned

What is the 9th term in the quadratic sequence shown below?

2, 5, 10, 17, 26, ...

Answers: (Interface Type: TEXT_FIELD)
✓ **82**

(Problem ID: 15695) RADIO_BUTTON [MA - 2004 - Spring - 27]
No knowledge components have been assigned



We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

44.) "pre_1999_19_10_R" (Problem ID: 15700) RADIO_BUTTON [MA - 1999 - SPRING - 19]
No knowledge components have been assigned

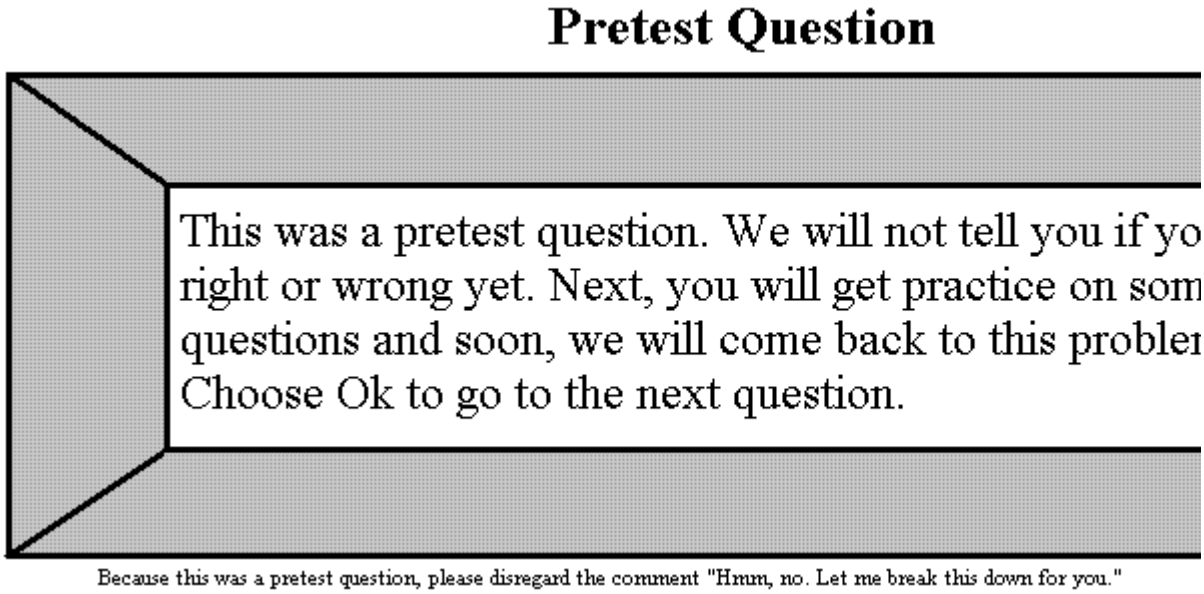
DIAMETER	COST
10"	$5.00
12"	$7.20
14"	$9.80
16"	$12.80

The Pizza Palace's price list for plain pizzas is shown above. Based on the information, what would a 20" pizza likely cost?
Answers: (Interface Type: RADIO_BUTTON)
✗ A) $14.80
✗ B) $14.40
✓ **C) $20.00**

✗ D) $10.00

(Problem ID: 15701) RADIO_BUTTON [MA - 1999 - SPRING - 19]

No knowledge components have been assigned



We will come back to this problem later. Select Ok and click Submit to continue.

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section

Begin Random Order Section

45.) "spring 2006 gr 10 no 29" (Problem ID: 13420) RADIO_BUTTON [MA - 2006 - SPRING - 29]

No knowledge components have been assigned

$a_1 = 4$

$a_2 = 2a_1 + 3$

$a_3 = 2a_2 + 3$

$a_4 = 2a_3 + 3$

The first four terms in a sequence, and the rules that define them, are shown above. What is the value of a_4, the fourth term in the sequence above?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 25

✗ B. 35

✗ C. 41

✓ **D. 53**

(Problem ID: 13421) ALGEBRA_FIELD [MA - 2006 - SPRING - 29]

In order to find the value of a_4, we must first find the values of a_2 and a_3. What is the value of a_2?

(Problem ID: 13422) ALGEBRA_FIELD [MA - 2006 - SPRING - 29]
Now that the value of a_2 is known, we can use it to find the value of a_3. What is the value of a_3?

(Problem ID: 13423) RADIO_BUTTON [MA - 2006 - SPRING - 29]
Now that the value of a_3 is known, we can use it to find the value of a_4. What is the value of a_4?

46.) "spring 2006 gr 10 no 1" (Problem ID: 13112) RADIO_BUTTON [MA - 2006 - SPRING - 1]

No knowledge components have been assigned

The first five terms in a quadratic sequence are shown below.

6, 9, 14, 21, 30, ...

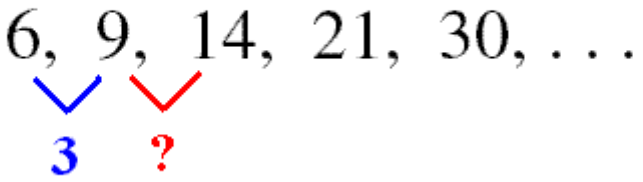
What is the next term in the sequence?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 39
✗ B. 40
✓ **C. 41**
✗ D. 42

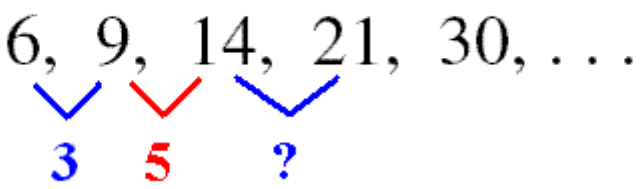
(Problem ID: 13113) ALGEBRA_FIELD [MA - 2006 - SPRING - 1]
Look at the pattern between the five given terms. Since this is a quadratic sequence, pay particular attention to the differences between each term. Start with the first two terms. What is the difference between 6 and 9?

(Problem ID: 13114) ALGEBRA_FIELD [MA - 2006 - SPRING - 1]



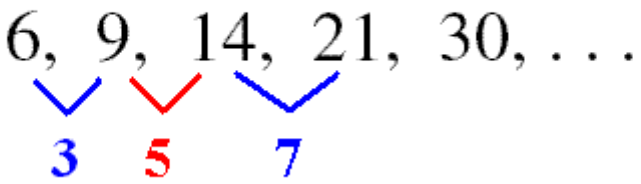
Now that we have one difference, let's find another. Consider the next two terms. What is the difference between 9 and 14?

(Problem ID: 13115) ALGEBRA_FIELD [MA - 2006 - SPRING - 1]



We have now found the first two differences. Moving on to the next two terms in the sequence, what is the difference between 14 and 21?

(Problem ID: 13117) RADIO_BUTTON [MA - 2006 - SPRING - 1]



Use the values we have found to determine the next term in the sequence. Find more differences if you need to. What is the next term in the sequence?

47.) "march 2006 retest gr 10 no 22" (Problem ID: 13499) RADIO_BUTTON [MA - 2006 - MAR - 22]

No knowledge components have been assigned

Martin chose 1 and 4 as the first two terms in a sequence. Each term after the first term is obtained by multiplying the term immediately before it by 3 and then adding 1, as shown below.

1, 4, 13, 40, ...

What is the sixth term in Martin's sequence?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 120
✗ B. 121
✗ C. 363
✓ **D. 364**

(Problem ID: 13500) ALGEBRA_FIELD [MA - 2006 - MAR - 22]

Since the first four terms are given along with the method of calculating the next term, the best strategy is to calculate the 5th term and then use it to find the 6th term. What is the 5th term?

(Problem ID: 13501) RADIO_BUTTON [MA - 2006 - MAR - 22]

Now that you know the 5th term, use it to find the 6th term. What is the 6th term?

48.) "November 2003 retest gr 10 no 32" (Problem ID: 14606) RADIO_BUTTON [MA - 2003 - NOV - 32]

No knowledge components have been assigned

An auditorium has 30 rows of seats. The first row has 40 seats. The second row has 42 seats. The third row has 44 seats. Each successive row has two more seats than the row before it. How many seats are there in the 30^{th} row?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 70 seats
✗ B. 74 seats
✓ **C. 98 seats**
✗ D. 100 seats

(Problem ID: 14607) RADIO_BUTTON [MA - 2003 - NOV - 32]

Which sentence describes the correct way to find the number of seats in a given row?

(Problem ID: 14608) RADIO_BUTTON [MA - 2003 - NOV - 32]

Now that you know how to find the number of seats in a given row, do so for the 30^{th} row. How many seats are in the 30^{th} row?

49.) "spring 2006 gr 10 no 22" (Problem ID: 13411) RADIO_BUTTON [MA - 2006 - SPRING - 22]

No knowledge components have been assigned

Jody's Gift from Her Aunt

Jody's Age (years)	1	2	3	4
Amount of Gift	$1	$3	$6	$10

Each year Jody receives a gift of money from her aunt. The amount is always equal to Jody's age that year, plus the amount she received the previous year, as shown in the table above. If the pattern continues, what amount will Jody receive from her aunt when Jody's age is 8 years?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. $36**
✗ B. $28
✗ C. $21
✗ D. $16

(Problem ID: 13412) ALGEBRA_FIELD [MA - 2006 - SPRING - 22]

Jody's Gift from Her Aunt

Jody's Age (years)	1	2	3	4	5
Amount of Gift	$1	$3	$6	$10	

Since the problem inquires about Jody at the age of eight, it may be quickest just to continue the table for the next few years. How many dollars will she receive when she is 5?

(Problem ID: 13413) ALGEBRA_FIELD [MA - 2006 - SPRING - 22]

Jody's Gift from Her Aunt

Jody's Age (years)	1	2	3	4	5	6
Amount of Gift	$1	$3	$6	$10	$15	

How many dollars will she receive when she is 6?

(Problem ID: 13414) ALGEBRA_FIELD [MA - 2006 - SPRING - 22]

Jody's Gift from Her Aunt

Jody's Age (years)	1	2	3	4	5	6	7
Amount of Gift	$1	$3	$6	$10	$15	$21	

How many dollars will she receive when she is 7?

(Problem ID: 13415) RADIO_BUTTON [MA - 2006 - SPRING - 22]

Jody's Gift from Her Aunt

Jody's Age (years)	1	2	3	4	5	6	7	8
Amount of Gift	$1	$3	$6	$10	$15	$21	$28	

How many dollars will she receive when she is 8?

50.) "spring 2006 gr 10 no 34" (Problem ID: 13432) RADIO_BUTTON [MA - 2006 - SPRING - 34]

No knowledge components have been assigned

Decrease in Value of Mr. Lee's Car

Number of Years After Purchase	Value of Car
0	$15,000
1	$13,500
2	$12,150
3	?

When Mr. Lee purchased his car, it had a value of $15,000. In each of the first 2 years after he purchased it, its value decreased by 10% of the previous year's value, as shown in the table above. If the value of Mr. Lee's car continues to decrease each year by 10% of the previous year's value, what will be the value of his car 3 years after he purchased it?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $1,215
✗ B. $4,500
✗ C. $10,500
✓ **D. $10,935**

(Problem ID: 13433) ALGEBRA_FIELD [MA - 2006 - SPRING - 34]

The value of Mr. Lee's car after 3 years can be found by subtracting 10% of the car's value after 2 years from the car's value after 2 years. What is 10% of the car's value after 2 years, in dollars?

(Problem ID: 13437) RADIO_BUTTON [MA - 2006 - SPRING - 34]

Subtract $1,215 from $12,150 to find the value of Mr. Lee's car after 3 years. How many dollars is Mr. Lee's car worth after 3 years?

End Random Order Section Begin Random Order Section

51.) "13420 Hint Version (spring 2006 gr 10 no 29)" (Problem ID: 15371) RADIO_BUTTON [MA - 2006 - SPRING - 29]

No knowledge components have been assigned

$a_1 = 4$

$a_2 = 2a_1 + 3$

$a_3 = 2a_2 + 3$

$a_4 = 2a_3 + 3$

The first four terms in a sequence, and the rules that define them, are shown above. What is the value of a_4, the fourth term in the sequence above?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 25
✗ B. 35
✗ C. 41
✓ **D. 53**

Hint 1:
In order to find the value of a_4, we must first find the values of a_2 and a_3. Start by finding the value of a_2.

Hint 2:
$a_2 = 2a_1 + 3$ where $a_1 = 4$.
$a_2 = 2(4) + 3$
$a_2 = 8 + 3$

$a_2 = 11$

Hint 3:
Now that the value of a_2 is known, we can use it to find the value of a_3.

$a_3 = 2a_2 + 3$ where $a_2 = 11$.
$a_3 = 2(11) + 3$
$a_3 = 22 + 3$

$a_3 = 25$

Hint 4:

Now that the value of a_3 is known, we can use it to find the value of a_4.

$a_4 = 2a_3 + 3$ where $a_3 = 25$

$a_4 = 2(25) + 3$

$a_4 = 50 + 3$

$a_4 = 53$

Select this answer.

52.) "13112 Hint Version (spring 2006 gr 10 no 1)" (Problem ID: 15400) RADIO_BUTTON

No knowledge components have been assigned

The first five terms in a quadratic sequence are shown below.

6, 9, 14, 21, 30, ...

What is the next term in the sequence?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 39

✗ B. 40

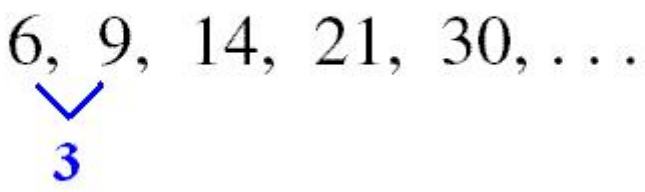
✓ **C. 41**

✗ D. 42

Hint 1:

Look at the pattern between the five given terms. Since this is a quadratic sequence, pay particular attention to the differences between each term. Start with the first two terms and continue on until you see a pattern.

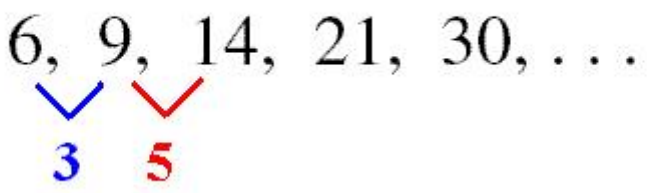
Hint 2:



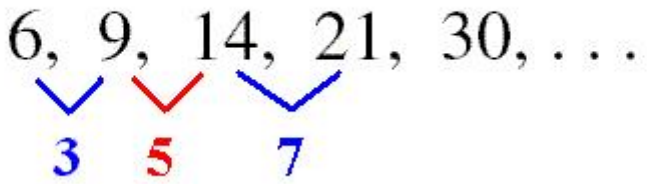
9 - 6 = 3

The difference between 6 and 9 is 3.

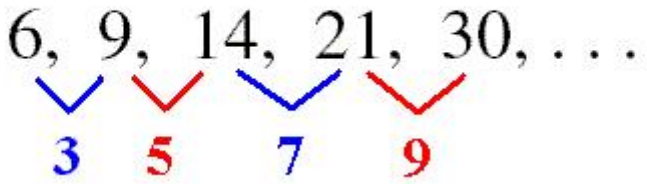
Hint 3:



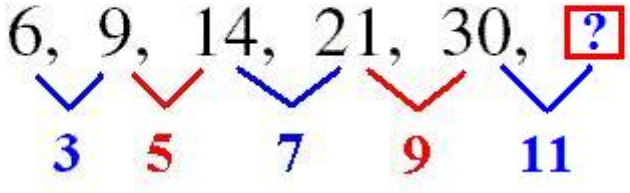
14 - 9 = 5
The difference between 9 and 14 is 5.
Hint 4:



21 - 14 = 7
The difference between 14 and 21 is 7.
Hint 5:



Each new term in the sequence is the sum of the preceding term and the next sequential odd number.
Hint 6:



The next sequential odd number is 11.
Add 11 to 30 to find the next term in the sequence.
Hint 7:

30 + 11 = 41

The next term in the sequence is 41. Select this answer.

53.) "13499 Hint Version (march 2006 retest gr 10 no 22)" (Problem ID: 15401) RADIO_BUTTON [MA - 2006 - MAR - 22]

No knowledge components have been assigned

Martin chose 1 and 4 as the first two terms in a sequence. Each term after the first term is obtained by multiplying the term immediately before it by 3 and then adding 1, as shown below.

1, 4, 13, 40, ...

What is the sixth term in Martin's sequence?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 120
✗ B. 121
✗ C. 363
✓ **D. 364**

Hint 1:
Since the first four terms are given along with the method of calculating the next term, the best strategy is to calculate the 5th term and then use it to find the 6th term.
Hint 2:
The 5th term is obtained by multiplying the 4th term, 40, by 3 and adding 1.

3(40) +1
120 +1
121

The 5th term is 121.
Hint 3:
Now that you know the 5th term, use it to find the 6th term. The 6th term is obtained by multiplying the 5th term, 121, by 3 and adding 1.
Hint 4:
3(121) +1
363 +1
364

The 6th term is 364. Select this answer.

54.) "14606 Hint Version (November 2003 retest gr 10 no 32)" (Problem ID: 15403) RADIO_BUTTON [MA - 2003 - NOV - 32]

No knowledge components have been assigned

An auditorium has 30 rows of seats. The first row has 40 seats. The second row has 42 seats. The third row has 44 seats. Each successive row has two more seats than the row before it. How many seats are there in the 30^{th} row?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 70 seats
✗ B. 74 seats

✓ **C. 98 seats**
✗ D. 100 seats

Hint 1:

Row	1	2	3	4	...
Number of Seats	40	42	44	?	...

The above table summarizes what we know. Look for a pattern.
Hint 2:

Row	1	2	3	4
Number of Seats	40	42	44	46
	2*0+40	2*1+40	2*2+40	2*3+40

The above table shows how the number of seats is obtained for each row. Notice the pattern used to obtain the number of seats in each row.

2*Number of rows in front of the given row + 40

The correct way to find the number of seats in a given row is twice the number of rows in front of the given row plus 40.
Hint 3:
There are 29 rows in front of the 30^{th} row.
Hint 4:

Row	1	2	3	4	...
Number of Seats	40	42	44	46	...
	2*0+40	2*1+40	2*2+40	2*3+40	...

false
Hint 5:

$$2(29) + 40$$
$$58 + 40$$
$$98$$

false
Hint 6:

Row	1	2	3	4	...
Number of Seats	40	42	44	46	...
	2*0+40	2*1+40	2*2+40	2*3+40	...

false
Hint 7:
There are 98 seats in the 30th row. Select this answer.

55.) "13411 Hint Version (spring 2006 gr 10 no 22)" (Problem ID: 15407) RADIO_BUTTON [MA - 2006 - SPRING - 22]

No knowledge components have been assigned

Jody's Gift from Her Aunt

Jody's Age (years)	1	2	3	4
Amount of Gift	$1	$3	$6	$10

Each year Jody receives a gift of money from her aunt. The amount is always equal to Jody's age that year, plus the amount she received the previous year, as shown in the table above. If the pattern continues, what amount will Jody receive from her aunt when Jody's age is 8 years?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. $36**
✗ B. $28
✗ C. $21
✗ D. $16

Hint 1:
Since the problem inquires about Jody at the age of eight, it may be quickest just to continue the table for the next few years. Start by finding how much Jody receives from her aunt at age 5 and build the table up until you reach age 8.
Hint 2:

Jody's Gift from Her Aunt at Age 5.

Jody's Age (years)	1	2	3	4	5
Amount of Gift	$1	$3	$6	$10	**$15**

She will be 5 this year, and she received $10 the previous year.
Add $5 to $10.
She will receive $15.
Hint 3:

Jody's Gift from Her Aunt at Age 6.

Jody's Age (years)	1	2	3	4	5	6
Amount of Gift	$1	$3	$6	$10	**$15**	**$21**

She will be 6 this year, and she received $15 the previous year.
Add $6 to $15.

She will receive $21.
Hint 4:

Jody's Gift from Her Aunt at Age 7.

Jody's Age (years)	1	2	3	4	5	6	7
Amount of Gift	$1	$3	$6	$10	$15	$21	$28

She will be 7 this year, and she received $21 the previous year.
Add $7 to $21.
She will receive $28.
Hint 5:

Jody's Gift from Her Aunt at Age 8.

Jody's Age (years)	1	2	3	4	5	6	7	8
Amount of Gift	$1	$3	$6	$10	$15	$21	$28	$36

She will be 8 this year, and she received $28 the previous year.
Add $8 to $28.
She will receive $36.

Jody will receive $36 when she is 8. Select this answer.

56.) "13432 Hint Version (spring 2006 gr 10 no 34)" (Problem ID: 15366) RADIO_BUTTON [MA - 2006 - SPRING - 34]

No knowledge components have been assigned

Decrease in Value of Mr. Lee's Car

Number of Years After Purchase	Value of Car
0	$15,000
1	$13,500
2	$12,150
3	?

When Mr. Lee purchased his car, it had a value of $15,000. In each of the first 2 years after he purchased it, its value decreased by 10% of the previous year's value, as shown in the table above. If the value of Mr. Lee's car continues to decrease each year by 10% of the previous year's value, what will be the value of his car 3 years after he purchased it?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $1,215
✗ B. $4,500
✗ C. $10,500
✓ **D. $10,935**

Hint 1:
The value of Mr. Lee's car after 3 years can be found by subtracting 10% of the car's value after 2 years from the car's value after 2 years.
Hint 2:
The value of Mr. Lee's car after 2 years is $12,150.

Multiply this value by 0.1 to find what 10% of it is.
Hint 3:
(0.1)(12150) = 1215
10% of the car's value after 2 years is $1215.
Hint 4:
Subtract $1,215 from $12,150 to find the value of Mr. Lee's car after 3 years.
Hint 5:
12150 – 1215 = 10935

Mr. Lee's car is worth $10,935 after 3 years. Select this answer.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

57.) "spring 2004 gr 10 no 27" (Problem ID: 12866) RADIO_BUTTON

No knowledge components have been assigned

What is the 9th term in the quadratic sequence shown below?

2, 5, 10, 17, 26, ...

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 97
✓ **B. 82**
✗ C. 71
✗ D. 65

(Problem ID: 12867) ALGEBRA_FIELD

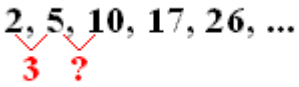
No knowledge components have been assigned

Look for any pattern between the five given terms. Since it is a quadratic sequence, look at the differences between consecutive terms. For starters, what is the difference between 2 and 5?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 12868) ALGEBRA_FIELD

No knowledge components have been assigned

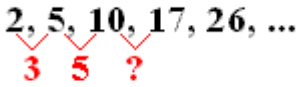


We have now found the first difference. Moving on, what is the difference between 5 and 10?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 12871) ALGEBRA_FIELD

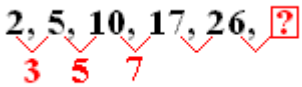
No knowledge components have been assigned



We have now found the first two differences. Now what is the difference between 10 and 17?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 12872) ALGEBRA_FIELD

No knowledge components have been assigned



The differences we have found, 3, 5 and 7, are all sequential odd numbers. Each new term is the sum of the preceding term and the next sequential odd number. What would be the next term in the sequence after 26?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 12873) RADIO_BUTTON

No knowledge components have been assigned

Based on this pattern, what would the 9th term in the sequence be?
Answers: (Interface Type: RADIO_BUTTON)

58.) "March_2005_Retake_1" (Problem ID: 13473) RADIO_BUTTON

No knowledge components have been assigned

2, 8, 32, 128, 512,...

The first five terms in a geometric sequence are shown above. What is the next term in the sequence?
Answers: (Interface Type: RADIO_BUTTON)

✗ A) 1024
✗ B) 1536
✓ **C) 2048**
✗ D) 896

(Problem ID: 13474) RADIO_BUTTON

No knowledge components have been assigned

In order to solve this problem, we need to identify how the terms in the sequence are related. What pattern do you notice occurring from one term to the next?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13481) RADIO_BUTTON

No knowledge components have been assigned

Now that you know that each term is 4 times the previous term, you are ready to solve the problem. 512 is the last term. What would the next term have to be to satisfy the sequence?

Answers: (Interface Type: RADIO_BUTTON)

59.) "Spring_1999_19" (Problem ID: 13559) RADIO_BUTTON [MA - 1999 - SPRING - 19]

No knowledge components have been assigned

DIAMETER	COST
10"	$5.00
12"	$7.20
14"	$9.80
16"	$12.80

The Pizza Palace's price list for plain pizzas is shown above. Based on the information, what would a 20" pizza likely cost?

Answers: (Interface Type: RADIO_BUTTON)

✗ A) $14.80
✗ B) $14.40
✓ **C) $20.00**
✗ D) $10.00

(Problem ID: 13560) ALGEBRA_FIELD [MA - 1999 - SPRING - 19]

No knowledge components have been assigned

Upon first glance, the pricing for the pizza seems rather random. Let's try to see if we can find a pattern for how the price of a pizza is determined as size is increased. By how many dollars does the price go up from a 10" - 12" pizza?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13561) ALGEBRA_FIELD [MA - 1999 - SPRING - 19]

No knowledge components have been assigned

Good! Now what is the price difference between a 12" pizza and a 14" pizza?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13562) ALGEBRA_FIELD [MA - 1999 - SPRING - 19]

No knowledge components have been assigned

Great! Now find the difference in price between a 14" pizza and a 16" pizza.

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13563) RADIO_BUTTON [MA - 1999 - SPRING - 19]

No knowledge components have been assigned

Now that we have the price differences between the various sizes of pizza, can you make an

educated guess at the cost of a 20" pizza?
Answers: (Interface Type: RADIO_BUTTON)

60.) "march 2006 retest gr 10 no 12 " (Problem ID: 13476) RADIO_BUTTON [MA - 2006 - MAR - 12]

No knowledge components have been assigned

Fence Length (in feet)	Least Number of Fence Posts Needed
50	6
100	11
150	16
200	21

Mr. Johnson plans to build a fence along the back of his property. At a home improvement store, he saw the table above listing the least number of fence posts he will need for different fence lengths. According to the linear pattern in the table, what is the least number of fence posts Mr. Johnson will need to build a fence that is 80 feet long?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 7
✗ B. 8
✓ **C. 9**
✗ D. 10

(Problem ID: 13477) ALGEBRA_FIELD [MA - 2006 - MAR - 12]

No knowledge components have been assigned

The problem states that the numbers in the table form a linear pattern, so there must be a linear relationship between the least number of fence posts needed and the fence length. Look at the table to determine the rate of change of fence posts needed in terms of fence length. Let's start with the first jump from 50 feet to 100 feet. How many new fence posts do you need for that added 50 feet?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13478) ALGEBRA_FIELD [MA - 2006 - MAR - 12]

No knowledge components have been assigned

Since we are looking for a length of 80 feet, we can find how many posts we need for each additional 10 feet and add this on 3 times to the number of posts we need for 50 feet to get the number of posts we need for 80 feet. How many posts do we need for each additional 10 feet?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13479) RADIO_BUTTON [MA - 2006 - MAR - 12]

No knowledge components have been assigned

Now how many posts do you need for 80 feet?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

61.) "pretest_y_intercept" (Problem ID: 9796) ALGEBRA_FIELD

No knowledge components have been assigned

What is the y-intercept of the graph represented by the equation below?

$y = {}^{4}/_{5}x - 2$

Answers: (Interface Type: ALGEBRA_FIELD)

✓ **-2**

(Problem ID: 9797) RADIO_BUTTON

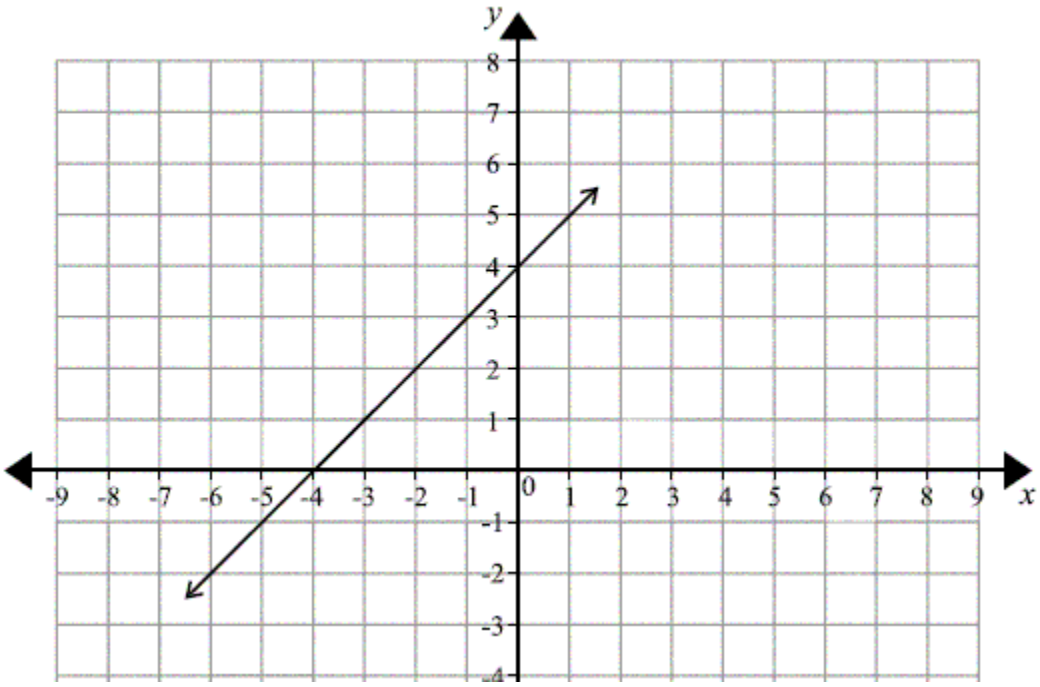
No knowledge components have been assigned

We will come back to this problem later, after you have had more practice.
Please click Ok to proceed.

Answers: (Interface Type: RADIO_BUTTON)

62.) "pre_2000_35_10" (Problem ID: 15720) RADIO_BUTTON [MA - 2000 - Spring - 35]

No knowledge components have been assigned



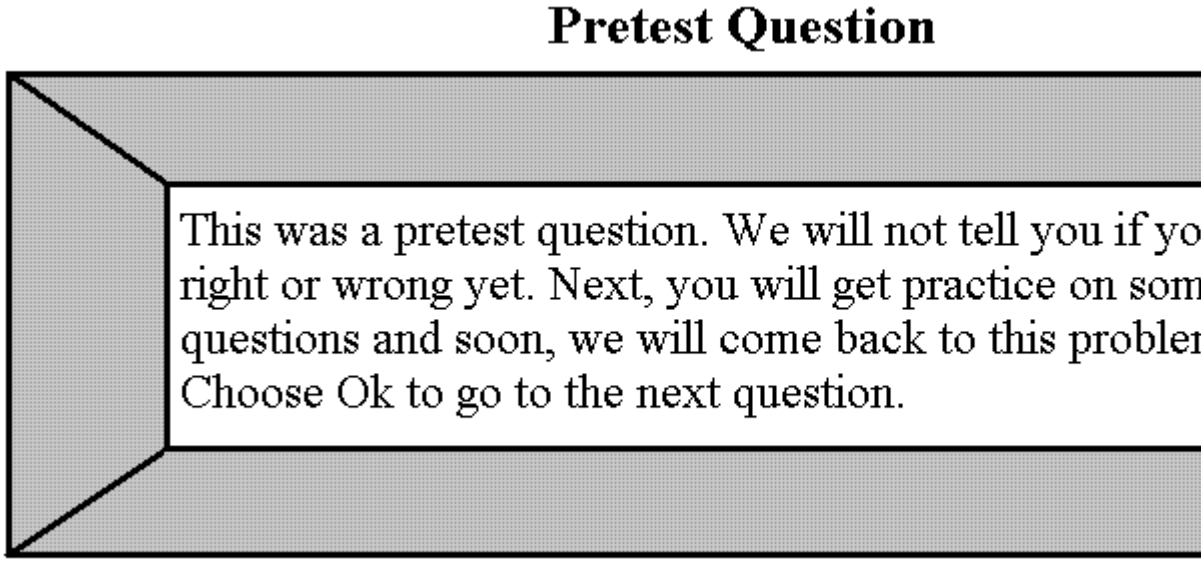
Which of the following equations is best represented by the graph?

Answers: (Interface Type: RADIO_BUTTON)

✗ -x - y = -4
✓ **y - x = 4**
✗ x + y = -4
✗ x + y = 4

(Problem ID: 15721) RADIO_BUTTON [MA - 2000 - Spring - 35]

No knowledge components have been assigned



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.

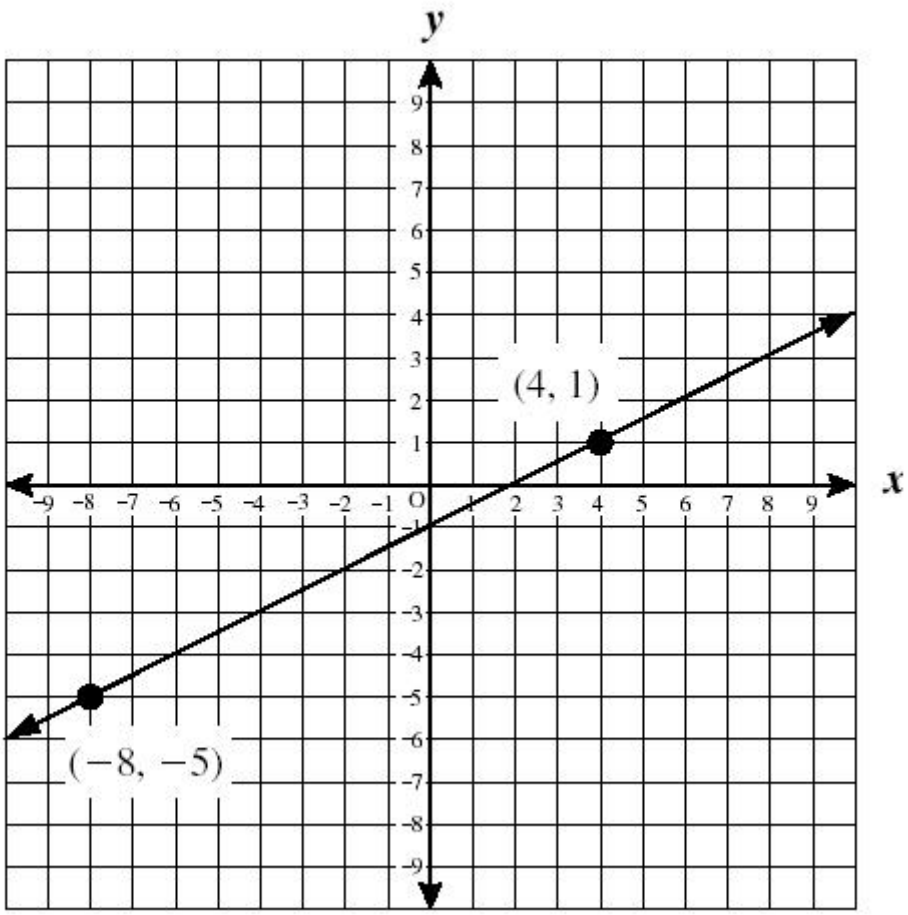
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section

Begin Random Order Section

63.) "November 2003 retest gr 10 no 18" (Problem ID: 14591) RADIO_BUTTON [MA - 2003 - NOV - 18]

No knowledge components have been assigned



Which of the following is the correct equation of the line drawn above?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. y = (1/2)x + 1
✓ **B. y = (1/2)x - 1**
✗ C. y = -(1/2)x - 1
✗ D. y = 2x - 1

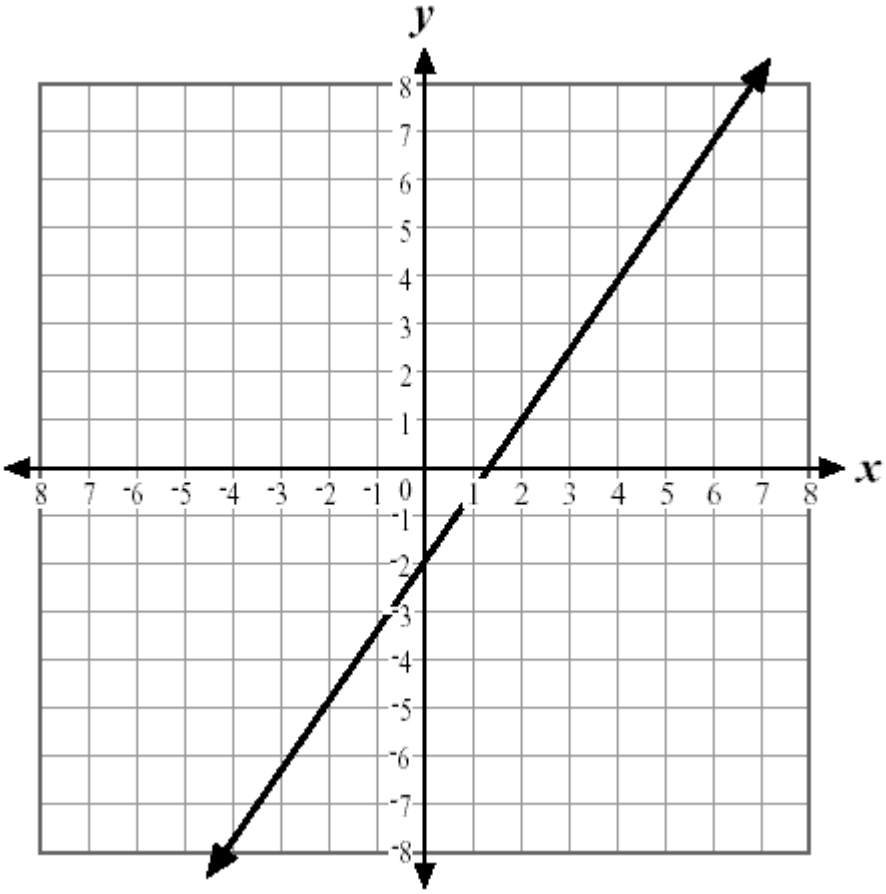
(Problem ID: 14592) ALGEBRA_FIELD [MA - 2003 - NOV - 18]
All of the possible answers are in slope-intercept form y = mx + b, where m is the slope of the line and b is the y-intercept of the line. Use the graph to find the slope and y-intercept of the line drawn. What is the slope?

(Problem ID: 14593) ALGEBRA_FIELD [MA - 2003 - NOV - 18]
The y-intercept can be determined just by looking at the graph. What is the y-intercept?

(Problem ID: 14594) RADIO_BUTTON [MA - 2003 - NOV - 18]
Now that the slope and y-intercept are known, substitute them into the equation y = mx + b to find the equation of the line drawn. Which of the following is the correct equation of the line drawn?

64.) "Fall 2002 retest gr 10 no 9" (Problem ID: 14532) RADIO_BUTTON [MA - 2002 - FALL - 9]

No knowledge components have been assigned



Which of the following **best** represents the equation of the line shown on the graph above?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. y = (3/2)x - 2**

✗ B. y = (2/3)x - 2

✗ C. y = -(3/2)x - (2/3)

✗ D. y = -(2/3)x - 2

(Problem ID: 14533) ALGEBRA_FIELD [MA - 2002 - FALL - 9]

All of the possible answers are given in slope-intercept form y = mx + b, where m is the slope and b is the y-intercept. You can find the slope and y-intercept from the graph and substitute the values into the equation y = mx + b to find the correct equation. Let's start by finding the slope m. What is the slope?

(Problem ID: 14534) ALGEBRA_FIELD [MA - 2002 - FALL - 9]

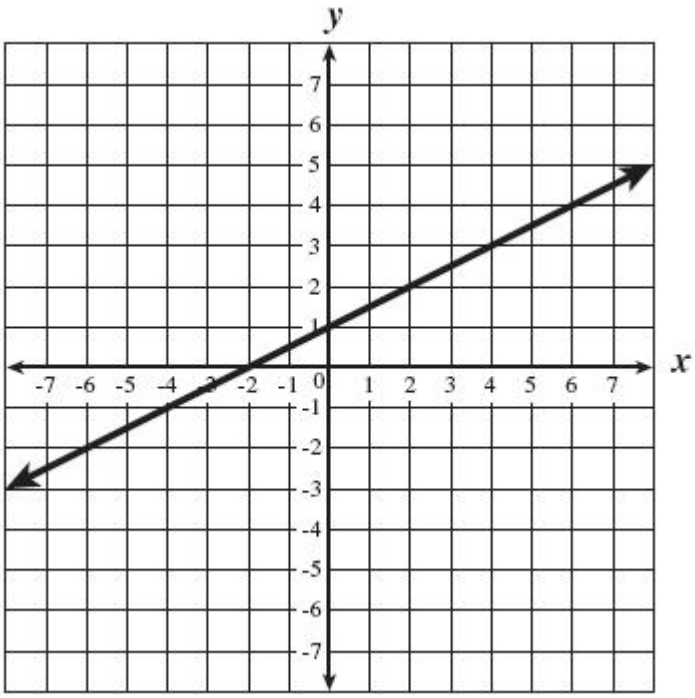
The y-intercept is the y-value on the graph where the graphed line crosses the y-axis. What is the y-intercept?

(Problem ID: 14535) RADIO_BUTTON [MA - 2002 - FALL - 9]

Now that the slope and y-intercept are known, which of the following best represents an equation of the graphed line?

65.) "spring 2004 gr 10 no 7" (Problem ID: 12794) RADIO_BUTTON [MA - 2004 - SPRING - 7]

No knowledge components have been assigned



What is the apparent x-intercept of the line graphed above?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. -2**

✗ B. 1

✗ C. -1

✗ D. 2

(Problem ID: 13949) RADIO_BUTTON [MA - 2004 - SPRING - 7]

First we must understand what the x-intercept is. Choose the definition of x-intercept.

(Problem ID: 13950) RADIO_BUTTON [MA - 2004 - SPRING - 7]

Now that we know what the x-intercept is, what is the x-intercept for this graph?

66.) "Spring 2004, Grade 10, Algebra, Item 3 (2006/10/05 10:50:04)" (Problem ID: 13902) RADIO_BUTTON [MA - 2004 - SPRING - 3]

No knowledge components have been assigned

What is the y-intercept of the line defined by y = 6x - 4?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. -4**

✗ B. -2/3

✗ C. 2/3

✗ D. 4

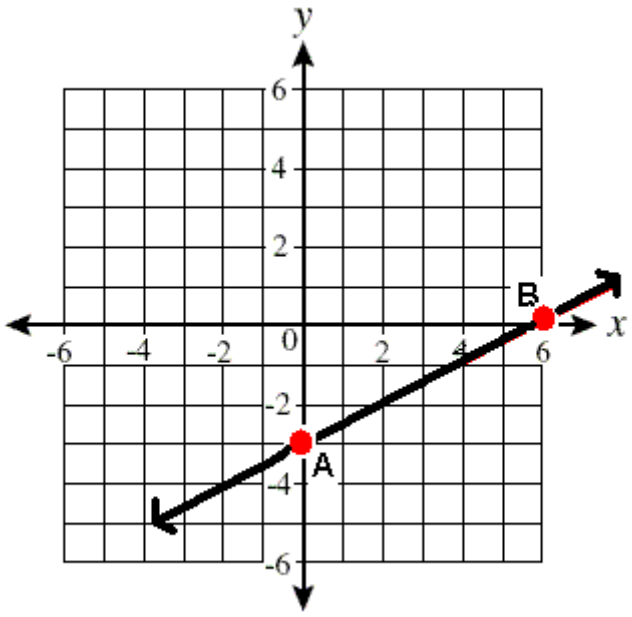
(Problem ID: 13903) RADIO_BUTTON [MA - 2004 - SPRING - 3]

The y-intercept is the value of y when x = 0. Substitute 0 for x in the equation y = 6x - 4. What is y when x = 0?

67.) "Item18_2003_find_slope_morph" (Problem ID: 2716) RADIO_BUTTON [MA - 2003 - Spring - 18]

Knowledge components:

Transfermodel	Knowledge Component
MCAS39-State_WPI-Simple	P.5.8-understanding-lineslope-concept
MCAS39-State_WPI-Simple	P.6.8-understanding-variable-roles
106-KC Transfer Model Created by WPI for 8th Grade Math	Understanding_Line_Slope_Intercept
106-KC Transfer Model Created by WPI for 8th Grade Math	Interpreting-Linear-Equations
MCAS5-State_WPI-Simple	P-Patterns-Relations-Algebra



What is the slope of the line graphed above?

Answers: (Interface Type: RADIO_BUTTON)

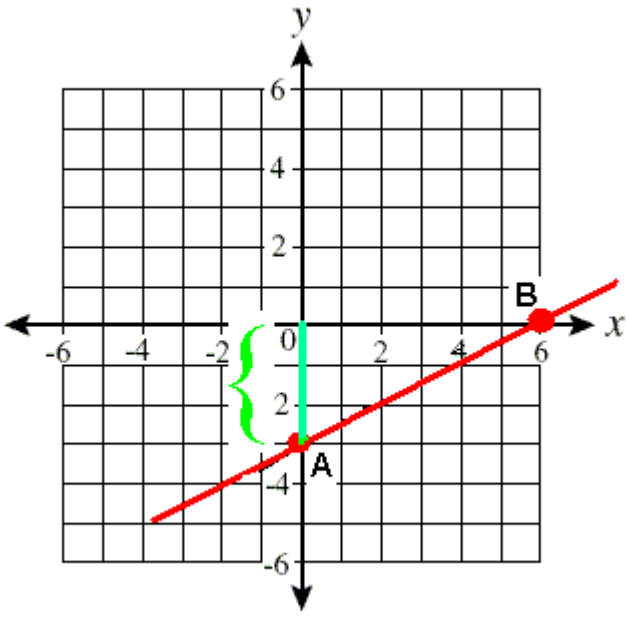
✓ **A. 3/6**

✗ B. 6/3

✗ C. 2

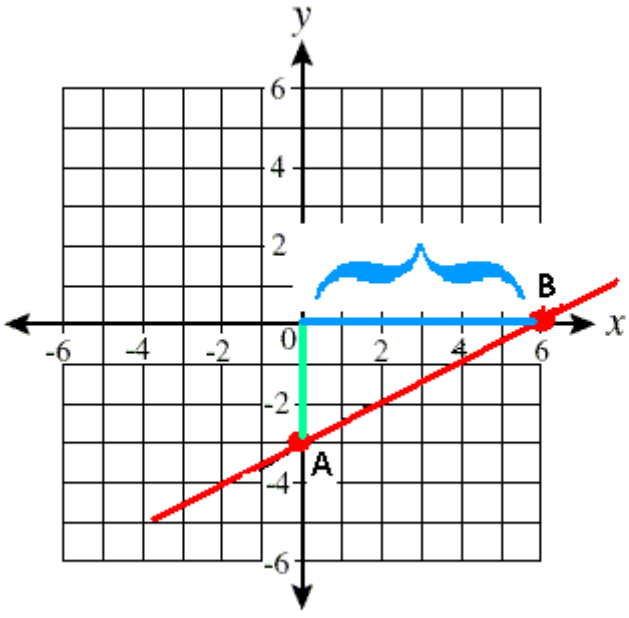
✗ D. 3

(Problem ID: 2713) ALGEBRA_FIELD [MA - 2003 - Spring - 18]



Slope is a number that measures the steepness of a straight line.
We measure slope by picking 2 points and dividing the change along the y-axis by the change along the x-axis.
What is the change along the y-axis for this line from point A to point B?

(Problem ID: 2714) ALGEBRA_FIELD [MA - 2003 - Spring - 18]



What is the change in x for this line from point A to point B?

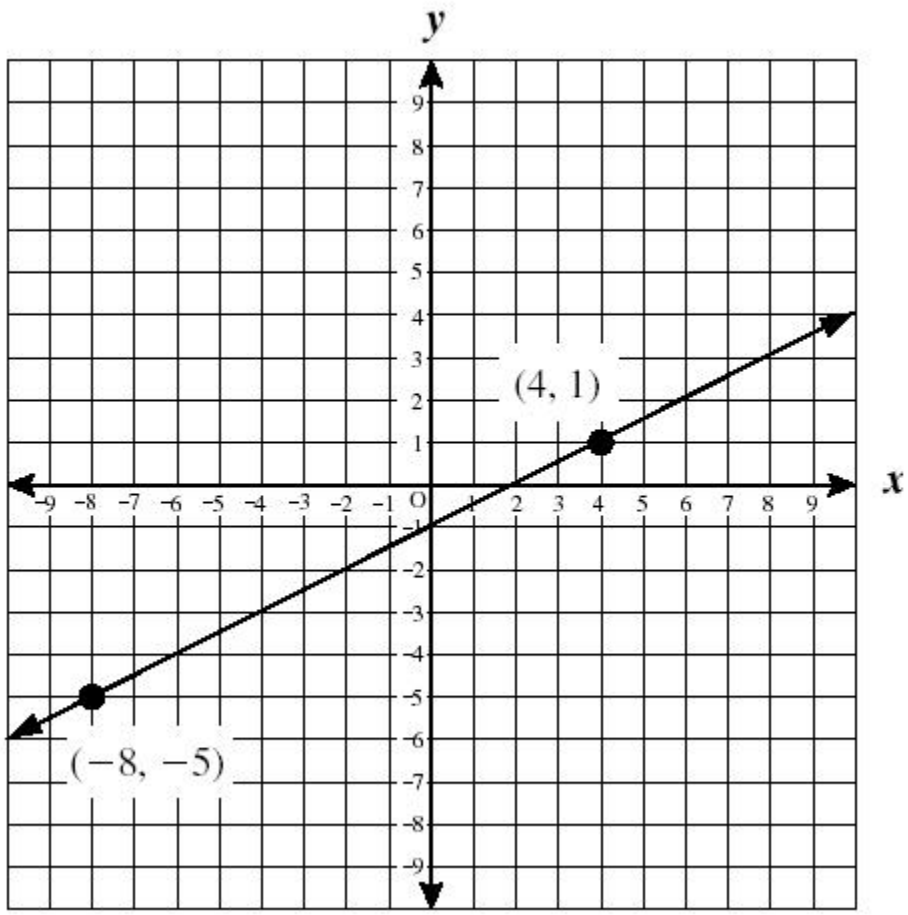
(Problem ID: 2715) ALGEBRA_FIELD [MA - 2003 - Spring - 18]

Good. Remember, the slope is the change in y divided by the change in x.
What is the slope for this line?

End Random Order Section Begin Random Order Section

68.) "14591 Hint Version (November 2003 retest gr 10 no 18)" (Problem ID: 15362) RADIO_BUTTON [MA - 2003 - NOV - 18]

No knowledge components have been assigned

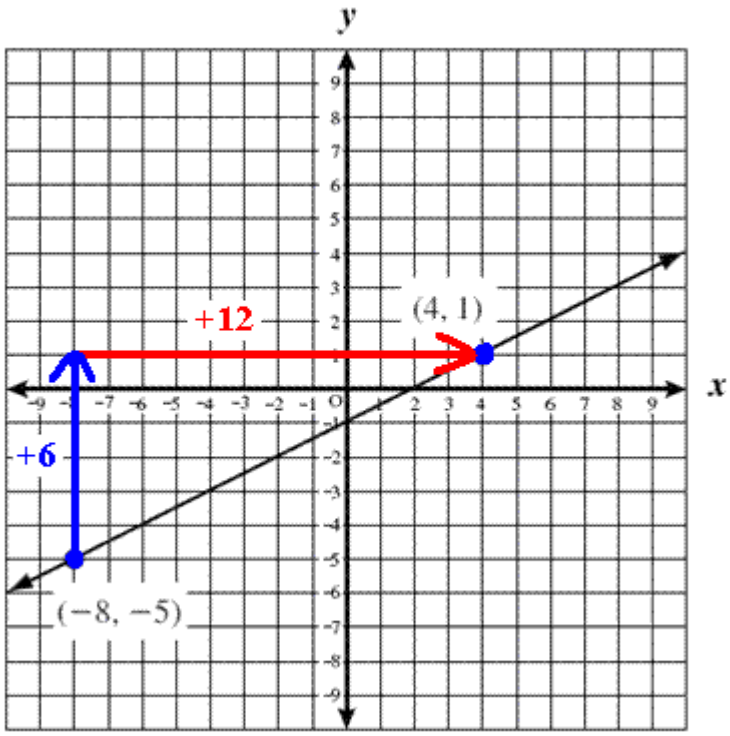


Which of the following is the correct equation of the line drawn above?

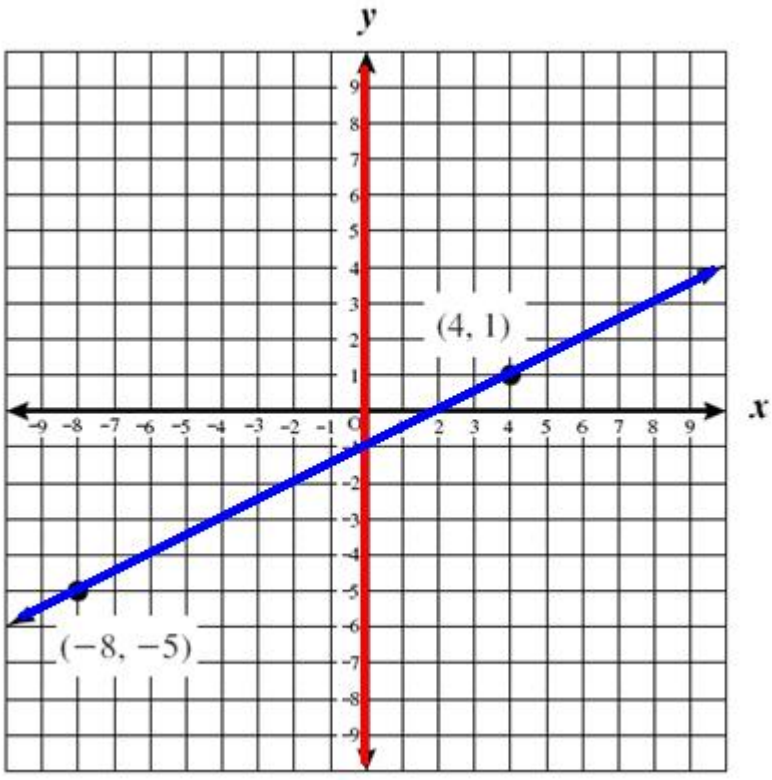
Answers: (Interface Type: RADIO_BUTTON)

✗ A. y = (1/2)x + 1
✓ **B. y = (1/2)x - 1**
✗ C. y = -(1/2)x - 1
✗ D. y = 2x - 1

Hint 1:
All of the possible answers are in slope-intercept form y = mx + b, where m is the slope of the line and b is the y-intercept of the line. Use the graph to find the slope and y-intercept of the line drawn.
Hint 2:



The slope of the line equals the rise over the run.
Using the two given points, the line rises 6 units while moving 12 units to the right.
Hint 3:
The slope is m = 6/12 = 1/2.
Hint 4:

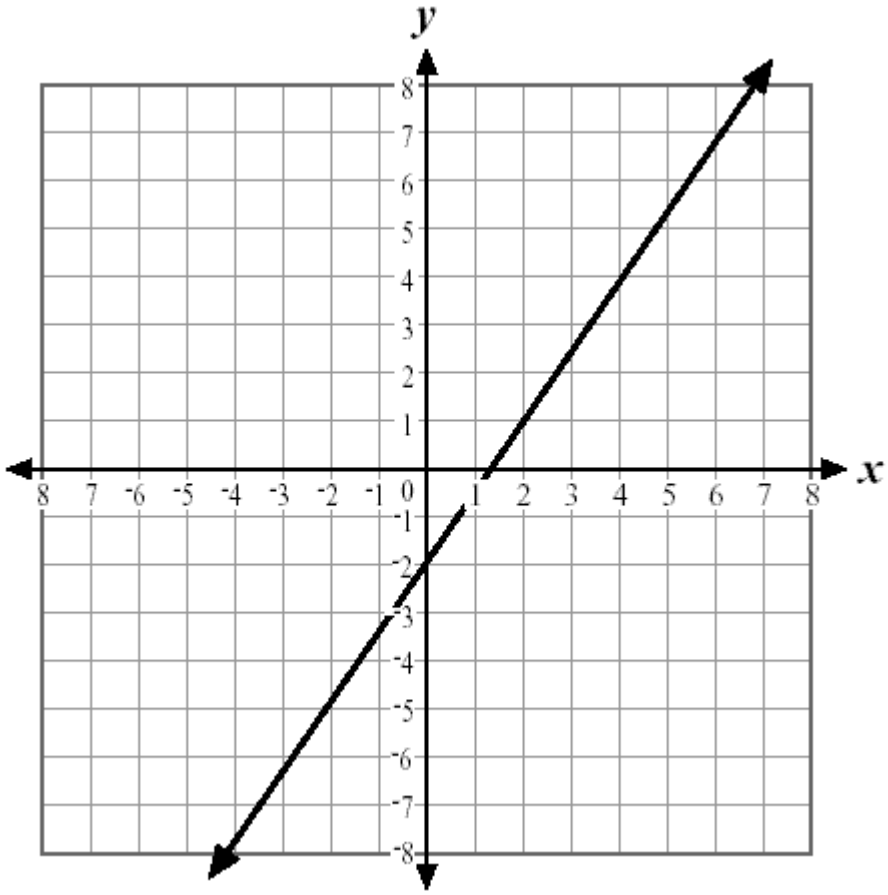


The y-intercept is the value of y at which the blue line intercepts the red line.
Hint 5:

The y-intercept is -1.
Hint 6:
Now that the slope and y-intercept are known, substitute them into the equation y = mx + b to find the equation of the line drawn.
Hint 7:
The correct equation of the line drawn is y = (1/2)x - 1. Select this answer.

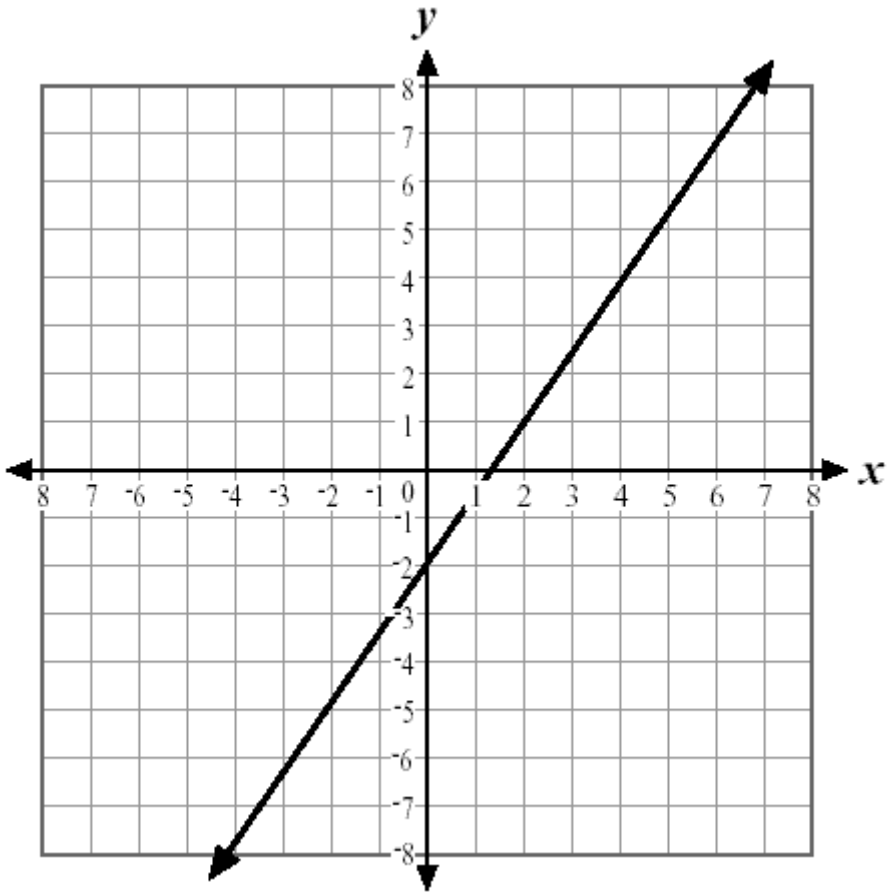
69.) "14532 Hint Version (Fall 2002 retest gr 10 no 9)" (Problem ID: 15363) RADIO_BUTTON [MA - 2002 - FALL - 9]

No knowledge components have been assigned

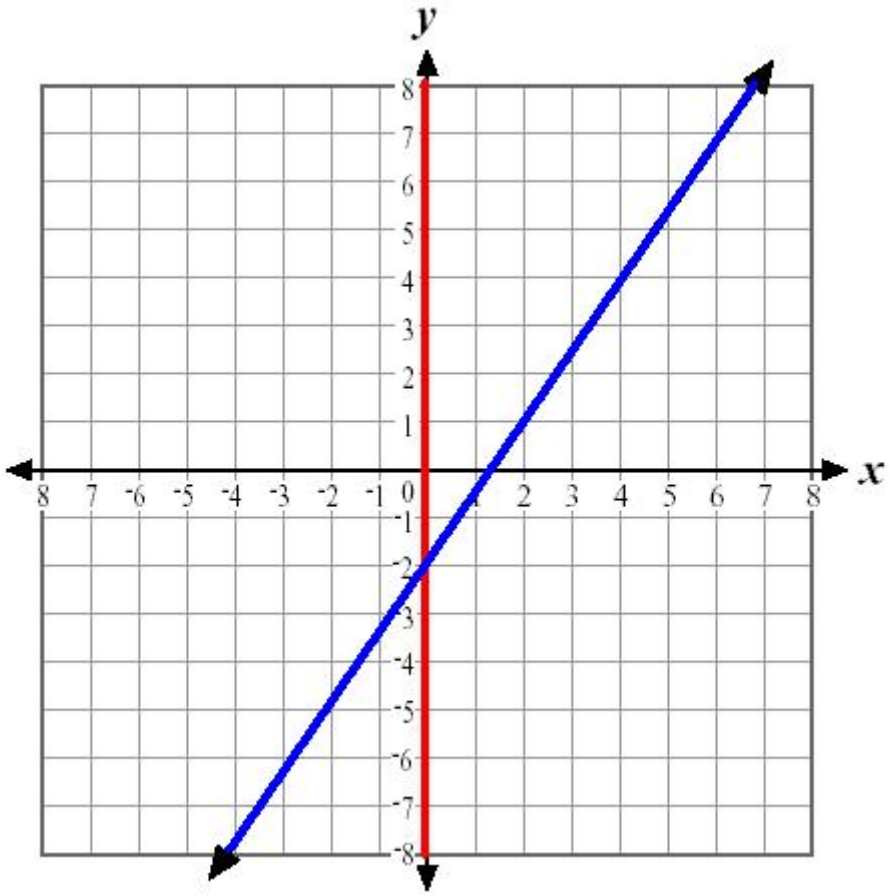


Which of the following **best** represents the equation of the line shown on the graph above?
Answers: (Interface Type: RADIO_BUTTON)
✓ **A. y = (3/2)x - 2**
✗ B. y = (2/3)x - 2
✗ C. y = -(3/2)x - (2/3)
✗ D. y = -(2/3)x - 2

Hint 1:
All of the possible answers are given in slope-intercept form y = mx + b, where m is the slope and b is the y-intercept. You can find the slope and y-intercept from the graph and substitute the values into the equation y = mx + b to find the correct equation.
Hint 2:



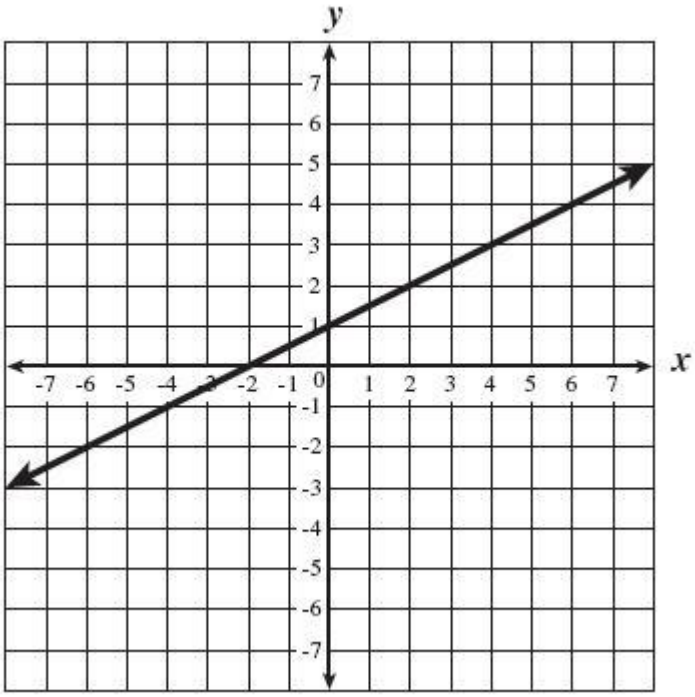
Remember the slope equals the rise over run from any two points. Let's choose two nice points like (0, -2) and (2, 1).
The graphed line moves up 3 units and 2 units to the right.
Hint 3:
The slope is m = 3/2.
Hint 4:



The y-intercept is the value of y at which the blue line intersects the red line.
Hint 5:
The y-intercept is b = -2.
Hint 6:
Now that the slope and y-intercept are known, substitute these values into the equation y = mx + b.
Hint 7:
The correct equation is y = (3/2)x - 2. Select this answer.

70.) "12794 Hint Version (spring 2004 gr 10 no 7)" (Problem ID: 15389) RADIO_BUTTON [MA - 2004 - SPRING - 7]

No knowledge components have been assigned



What is the apparent x-intercept of the line graphed above?

Answers: (Interface Type: RADIO_BUTTON)

✔ **A. -2**

✘ B. 1

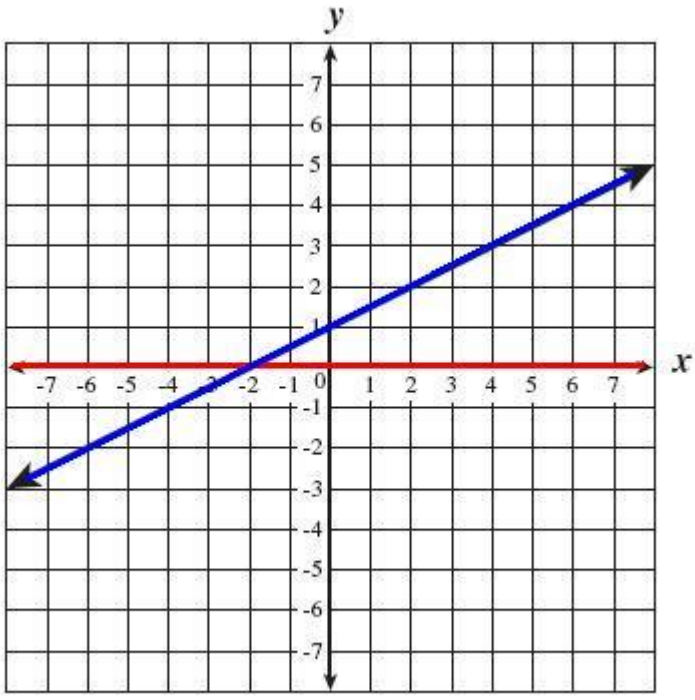
✘ C. -1

✘ D. 2

Hint 1:

The x-intercept is the value of x when the line crosses the x-axis.

Hint 2:



The x-intercept is the x value at the point where the blue line crosses the red x-axis.
Hint 3:
The graphed line crosses the x-axis at the x value of -2.
Hint 4:
The apparent x-intercept is -2. Select this answer.

71.) "Spring 2004, Item 3, Hints" (Problem ID: 15458) RADIO_BUTTON [MA - 2004 - SPRING - 3]

No knowledge components have been assigned

What is the y-intercept of the line defined by y = 6x - 4?

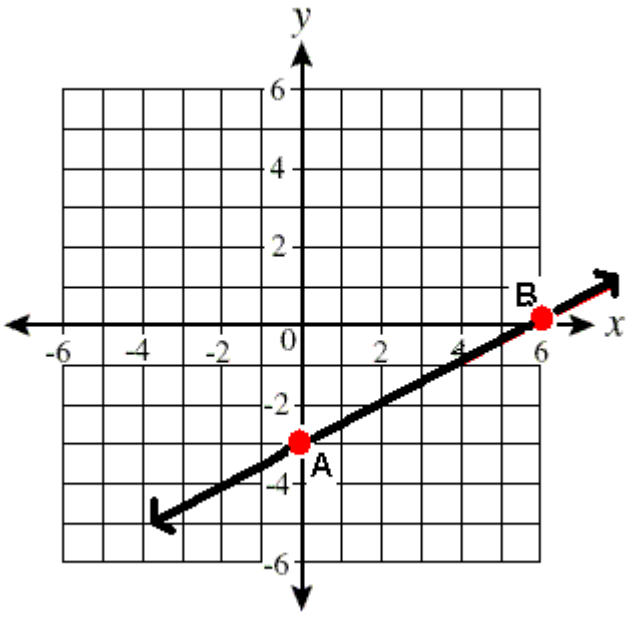
Answers: (Interface Type: RADIO_BUTTON)

✓ **A. -4**
✗ B. -2/3
✗ C. 2/3
✗ D. 4

Hint 1:
The y-intercept is the value of y when x = 0. Substitute 0 for x in the equation y = 6x - 4.
Hint 2:
Substituting 0 for x:
y = 6x - 4
y = 6(0) - 4
Hint 3:
y = -4. The answer is -4

72.) "hint_item3" (Problem ID: 9773) RADIO_BUTTON [MA - 2006 - SPRING - 29]

No knowledge components have been assigned



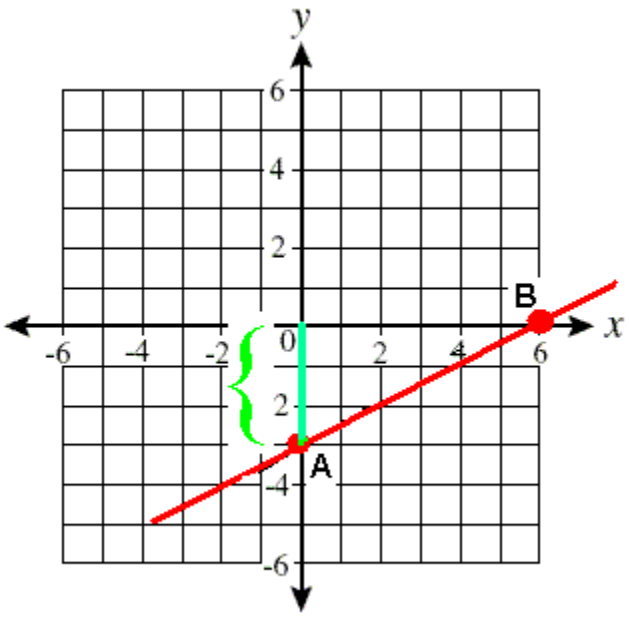
What is the slope of the line graphed above?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 3/6**

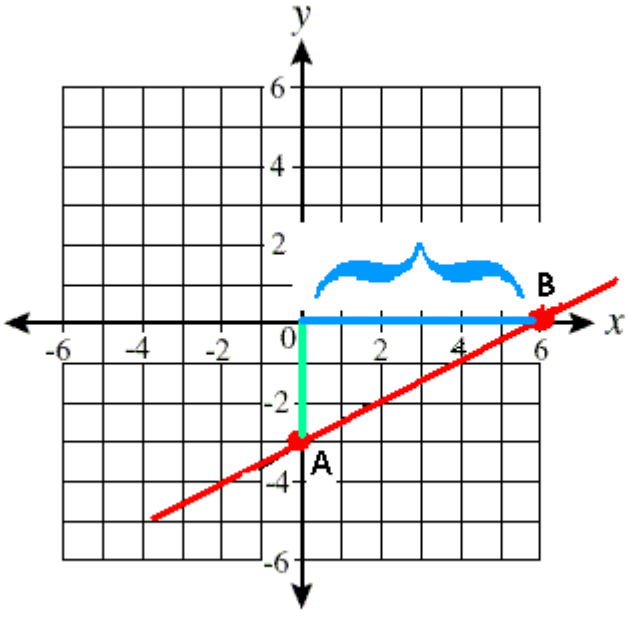
✗ B. 6/3
✗ C. 2
✗ D. 3

Hint 1:



Slope is defined as the change in y divided by the change in x from point A to point B.
What is the change in y from point A to point B?

Hint 2:



The change in y is 3.
What is the change in x from point A to point B?

Hint 3:

The change in x is 6.
What is the slope?

Hint 4:
The slope is 3/6

End Random Order Section
End '{Problem}' Section Begin Random Order Section

73.) "Spring2003_Grade10_Algebra_Item27(2006/08/31 15:04:54)" (Problem ID: 12520) RADIO_BUTTON [MA - 2003 - Spring - 27]

No knowledge components have been assigned
What is the slope of the line defined by the equation shown below?
5x + 2y = 10
Answers: (Interface Type: RADIO_BUTTON)
✗ A. -2/5
✓ **B. -5/2**
✗ C. 5/2
✗ D. 2/5

(Problem ID: 12521) RADIO_BUTTON [MA - 2003 - Spring - 27]

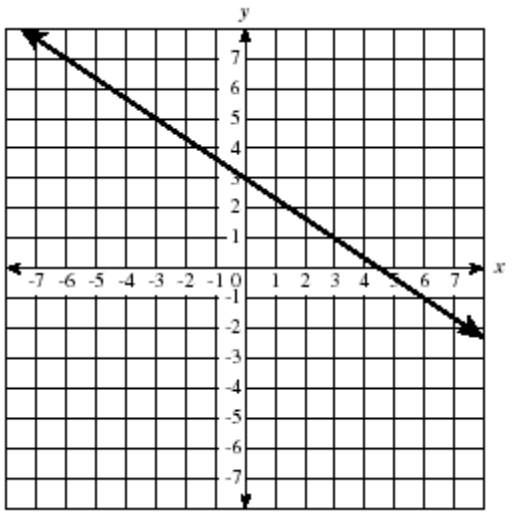
No knowledge components have been assigned
If we write the equation in the form y = mx +b where 'm' is a number and represents the slope of the line, and 'b' is also a number and represents the y-intercept, then we can find m to know the slope. Re-write the given equation 5x + 2y = 10 in the form y = mx +b.(you should have numbers in place of 'm' and 'b')
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 12532) RADIO_BUTTON [MA - 2003 - Spring - 27]

No knowledge components have been assigned
From equation y = (-5/2)x + 5: what is the slope of the line?
Answers: (Interface Type: RADIO_BUTTON)

74.) "March 2004 Re-test, Grade 10, Algebra, Item 7 (2006/10/24 20:55:47)" (Problem ID: 14349) RADIO_BUTTON [MA - 2004 - MARCH - 7]

No knowledge components have been assigned



Which of the following is the apparent slope of the line graphed below?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. -3/2
✓ **B. -2/3**
✗ C. 2/3
✗ D. 3/2

(Problem ID: 14350) RADIO_BUTTON [MA - 2004 - MARCH - 7]

No knowledge components have been assigned

Is the slope negative or positive?
Answers: (Interface Type: RADIO_BUTTON)

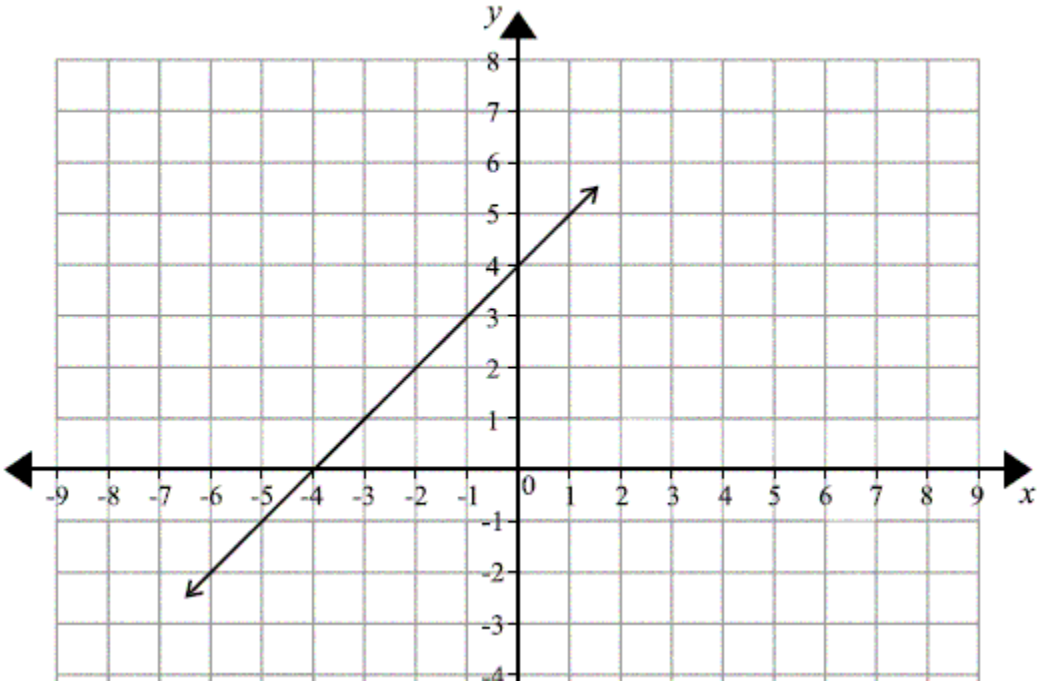
(Problem ID: 14351) RADIO_BUTTON [MA - 2004 - MARCH - 7]

No knowledge components have been assigned

Since the line is descending from left to right, the slope will be negative. Knowing this, you can immediately eliminate choices C and D. Now pick two points on the line and calculate the slope. What is the slope?
Answers: (Interface Type: RADIO_BUTTON)

75.) "Spring_2000_35" (Problem ID: 13178) RADIO_BUTTON [MA - 2000 - Spring - 35]

No knowledge components have been assigned



Which of the following equations is best represented by the graph?
Answers: (Interface Type: RADIO_BUTTON)
✗ -x - y = -4
✓ **y - x = 4**
✗ x + y = -4
✗ x + y = 4

(Problem ID: 13179) ALGEBRA_FIELD [MA - 2000 - Spring - 35]

No knowledge components have been assigned
The graph depicts a straight line, meaning this is a linear relationship that we are viewing. One equation for linear graphs is y = mx + b. What is the y intercept of the graph?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13180) TEXT_FIELD [MA - 2000 - Spring - 35]

No knowledge components have been assigned
Terrific! You found the y-intercept of the graph. You only have one more thing to find and this problem is in the bag! Calculate the slope of this graph. What is it?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 13925) RADIO_BUTTON [MA - 2000 - Spring - 35]

No knowledge components have been assigned
What is the equation of the line in y-intercept form?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13184) RADIO_BUTTON [MA - 2000 - Spring - 35]

No knowledge components have been assigned

Now that we know that the equation for the line is y = x + 4, which of the following equations represents the graph?
Answers: (Interface Type: RADIO_BUTTON)

76.) "Item7_2003_y_intercept" (Problem ID: 2726) ALGEBRA_FIELD [MA - 2003 - Spring - 7]

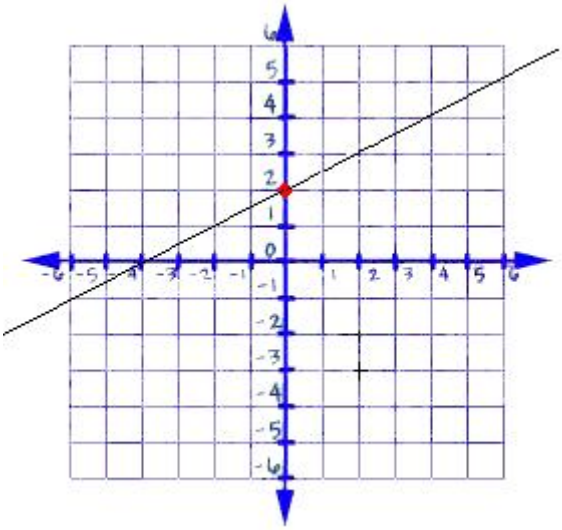
Knowledge components:

Transfermodel	Knowledge Component
MCAS39-State_WPI-Simple	P.5.8-understanding-lineslope-concept
MCAS39-State_WPI-Simple	P.6.8-understanding-variable-roles
106-KC Transfer Model Created by WPI for 8th Grade Math	Interpreting-Linear-Equations
MCAS5-State_WPI-Simple	P-Patterns-Relations-Algebra

What is the y-intercept of the graph represented by the equation below?
$y = {}^{4}/_{5}x - 2$

Answers: (Interface Type: ALGEBRA_FIELD)
✔ **-2**
✔ **y=-2**

Hint 1:



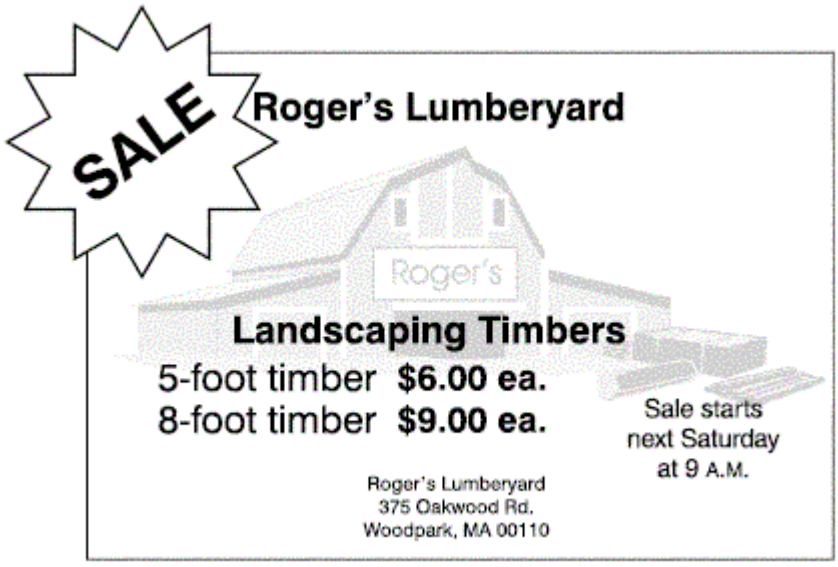
The y-intercept is the y-value of the point where a line crosses the y-axis.
In the image above, the y-intercept is at the red point.
The y-value at this point is 2, so the y-intercept for this graph is 2.
Hint 2:
Notice that the x-value at the y-intercept is always 0. To find the y-intercept when given an equation, substitute x with 0. What does y equal when x is 0?
$y = {}^{4}/_{5}(0) - 2$
Hint 3:

***y* = 0 - 2**
***y* = - 2**
Hint 4:
The answer is -2. Type in -2

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

77.) "pre_2000_36_10" (Problem ID: 15705) RADIO_BUTTON [MA - 2000 - Spring - 36]

No knowledge components have been assigned



Misha and his sister are using 5-foot and 8-foot landscaping timbers to enclose a vegetable garden. They bought 40 timbers. The total cost for the timbers was $288. Which pair of equations could be used to find the number of timbers of each size that they bought?

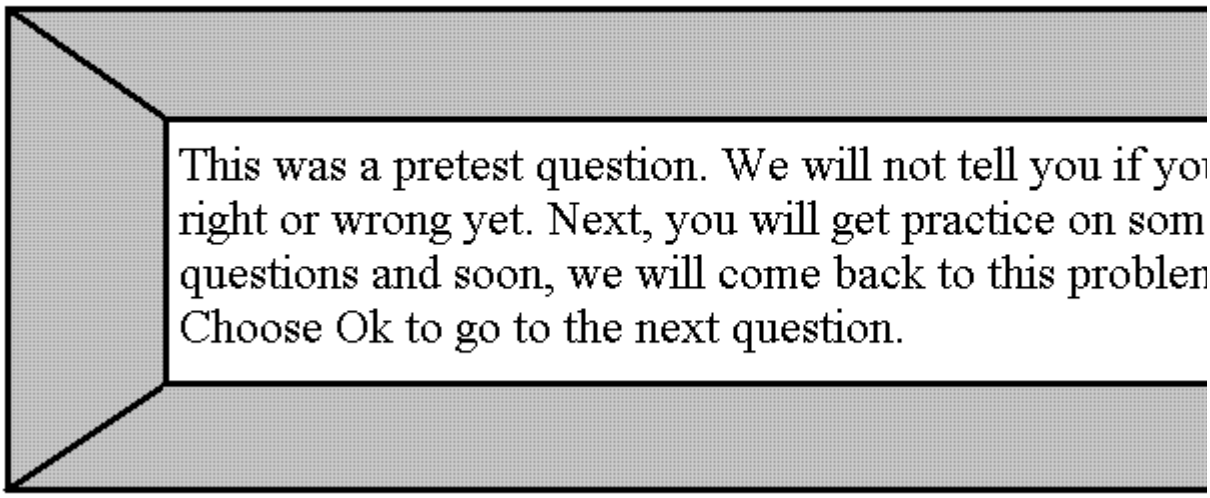
Answers: (Interface Type: RADIO_BUTTON)

✗ A) 6x + 9y = 40 and x + y = 288
✗ B) x + y = 40 and 5x + 8y = 288
✗ C) 5x + 8y = 40 and 6x + 9y = 288
✓ **D) x + y = 40 and 6x + 9y = 288**

(Problem ID: 15706) RADIO_BUTTON [MA - 2000 - Spring - 36]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

78.) "pre_2005_30_10_R" (Problem ID: 15709) ALGEBRA_FIELD [MA - 2005 - MAR - 30]

No knowledge components have been assigned

Kim observed that the price, in dollars, of a certain stock changed as follows.

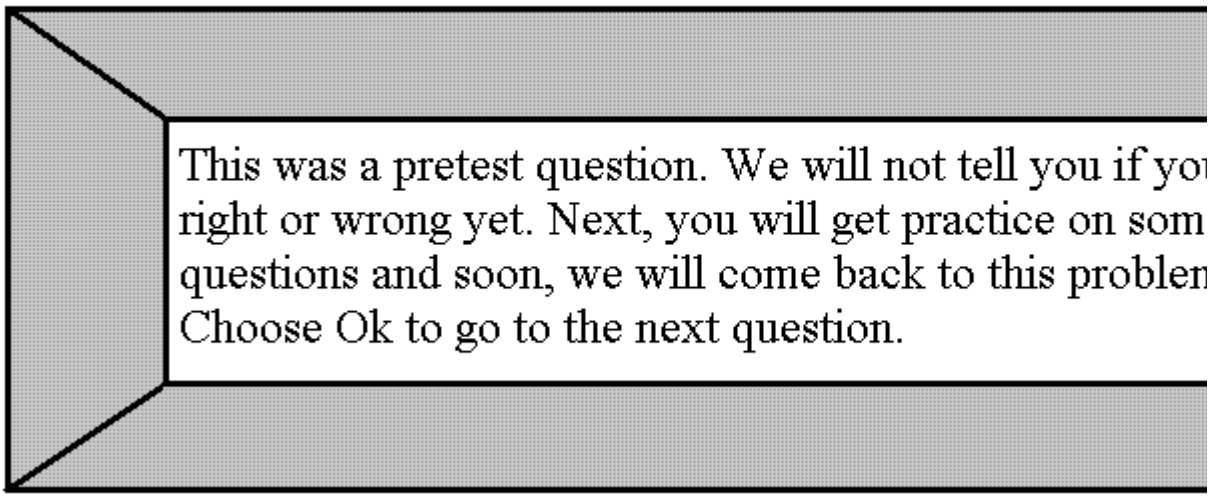
- First the price increased by 4 dollars
- Second, the price decreased by 7 dollars
- Third, the price increased by 2 dollars
- Finally, the price tripled.

If x represents the original price, in dollars, of this stock, write an expression that represents its final price.
Answers: (Interface Type: ALGEBRA_FIELD)
✓ **3(x - 1)**

(Problem ID: 15710) RADIO_BUTTON [MA - 2005 - MAR - 30]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

79.) "may 1998 gr 10 no. 10" (Problem ID: 12519) RADIO_BUTTON [MA - 1998 - SPRING - 10]

No knowledge components have been assigned

A repair service charges $25 to send a service person on a call and $30 per hour for labor. If *h* stands for the number of hours of labor, which expression below can the company use to compute the charge for the service call?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 25*h* + 30
✗ B. 55*h*
✗ C. 25/(30*h*)
✓ **D. 25 + 30*h***

(Problem ID: 14496) RADIO_BUTTON [MA - 1998 - SPRING - 10]

The problem statement details the pricing policies of a repair service. Which of the following statements correctly describes the cost of sending a service person on a call with *h* hours of labor?

(Problem ID: 14498) RADIO_BUTTON [MA - 1998 - SPRING - 10]

Now that we know that you can find the cost of any service call by finding the amount it costs to send a service person on a call **plus** the cost of labor per hour **multiplied by** the number of hours of labor, substitute the values given in the problem statement to find the correct expression. Which expression below can the company use to compute the charge for a service call with *h* hours of labor?

80.) "march 2006 retest gr 10 no 39" (Problem ID: 13543) RADIO_BUTTON [MA - 2006 - MAR - 39]

No knowledge components have been assigned

In an experiment, the temperature of a room was lowered 6 degrees every hour. The original temperature of the room was 72 degrees.

Which of the following equations correctly expresses T, the temperature, in degrees, of the room, as a function of h, the number of hours that have passed?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. T = -6h - 72
✗ B. T= -12h - 72
✓ **C. T = - 6h + 72**
✗ D. T = -12h + 72

(Problem ID: 13544) RADIO_BUTTON [MA - 2006 - MAR - 39]

Which of the following statements correctly describes the temperature of the room, in degrees, after h hours?

(Problem ID: 13545) RADIO_BUTTON [MA - 2006 - MAR - 39]

Which of the following equations represents the original temperature minus six degrees for every hour that has passed?

81.) "Fall 2001 retest gr 10 no 6" (Problem ID: 14765) RADIO_BUTTON [MA - 2001 - FALL - 6]

No knowledge components have been assigned

n	1	2	3	4	5	6
a_n	0	3	8	15	24	35

If the pattern in the above table continues, which of the following expressions represents a_n?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $2^n - 1$
✗ B. $(n - 1)^2$
✗ C. $3(n - 1)$
✓ **D. $n^2 - 1$**

(Problem ID: 14766) ALGEBRA_FIELD [MA - 2001 - FALL - 6]

Since there are only four possible expressions given, you can check each one to see if there is a set of values in the table that makes the expression untrue. Start with the expression of choice A, $2^n - 1$. What is the value of this expression after you substitute n = 1 into the expression and simplify?

(Problem ID: 14767) RADIO_BUTTON [MA - 2001 - FALL - 6]

According to the table, $a_n = 0$ when n =1, but the expression $2^n - 1$ gives the result $a_n = 1$ when n = 1. Therefore, this expression cannot be correct. Check the remaining

expressions to find one that does work for all the values in the table. Which of the following expressions represents a_n?

82.) "spring 2004 gr 10 no 15" (Problem ID: 12851) RADIO_BUTTON [MA - 2004 - Spring - 15]

No knowledge components have been assigned

x	y
1	8
3	10
5	12
7	14
9	16

The above table represents a linear relationship between x and y. What is an equation for y in terms of x?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. y = x + 7**

✗ B. y = 2x + 4

✗ C. y = -x + 7

✗ D. y = 3x + 7

(Problem ID: 12852) ALGEBRA_FIELD [MA - 2004 - Spring - 15]

The general equation for a linear relationship with y in terms of x is y = m*x + b. To write this equation we need to know the slope m and the y-intercept b. Let's start by finding the slope. How much does the y value change each time the x value changes by 1?

(Problem ID: 12853) ALGEBRA_FIELD [MA - 2004 - Spring - 15]

The equation now becomes y = 1*x + b. The y-intercept is the y value when x = 0. Use the table to find the value of y when x = 0. What is the y-intercept?

(Problem ID: 12859) RADIO_BUTTON [MA - 2004 - Spring - 15]

Now that both m and b are known, what is the equation that describes the points in the table?

End Random Order Section Begin Random Order Section

83.) "12519 Hint Version (may 1998 gr 10 no. 10)" (Problem ID: 15358) RADIO_BUTTON [MA - 1998 - SPRING - 10]

No knowledge components have been assigned

A repair service charges $25 to send a service person on a call and $30 per hour for labor. If *h* stands for the number of hours of labor, which expression below can the company use to compute

the charge for the service call?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 25*h* + 30
✗ B. 55*h*
✗ C. 25/(30*h*)
✓ **D. 25 + 30*h***

Hint 1:
According to the problem, you can find the cost of any service call by finding the amount it costs to send a service person on a call **plus** the cost of labor per hour **multiplied by** the number of hours of labor.
Hint 2:
Substitute the following values given in the problem into the above statement describing the the cost of any service call.

the amount it costs to send a service person on a call = $25
the cost of labor per hour = $30
the number of hours of labor = *h*
Hint 3:
Cost of sending a service person on a call plus cost of labor per hour multi

$25 + $30/hr.* *h* hours

25 + 30*h

false
Hint 4:
The correct expression is 25 + 30*h*. Select this answer.

84.) "13543 Hint Version (march 2006 retest gr 10 no 39)" (Problem ID: 15359) RADIO_BUTTON

No knowledge components have been assigned
In an experiment, the temperature of a room was lowered 6 degrees every hour. The original temperature of the room was 72 degrees.

Which of the following equations correctly expresses T, the temperature, in degrees, of the room, as a function of *h*, the number of hours that have passed?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. T = -6*h* - 72
✗ B. T= -12*h* - 72
✓ **C. T = - 6*h* + 72**
✗ D. T = -12*h* + 72

Hint 1:
The temperature in the room, in degrees, after *h* hours can be described by the original temperature **minus** six degrees for every hour that has passed.
Hint 2:
Substitute the following given values into the above statement describing the temperature in the room, in degrees, after *h* hours.

the original temperature = 72
six degrees for every hour that has passed = 6*h*
Hint 3:

The equation represents the original temperature minus 6 degrees for every hour that has

$$T = 72 - 6h$$

false

Hint 4:

Since T = 72 - 6*h* is not an option, you must choose an equivalent expression, which can be obtained by rearranging terms.

T = 72 - 6*h* or

T = 72 + (-6*h*) or

T = -6*h* + 72

Select T = -6*h* + 72.

85.) "14765 Hint Version (Fall 2001 retest gr 10 no 6)" (Problem ID: 15369) RADIO_BUTTON [MA - 2001 - FALL - 6]

No knowledge components have been assigned

n	1	2	3	4	5	6
a_n	0	3	8	15	24	35

If the pattern in the above table continues, which of the following expressions represents a_n?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. $2^n - 1$

✗ B. $(n - 1)^2$

✗ C. $3(n - 1)$

✓ **D. $n^2 - 1$**

Hint 1:

Since there are only four possible expressions given, you can check each one to see if there is a set of values in the table that makes the expression untrue. The correct expression will be true for **all** values in the table.

Hint 2:

Start with the expression of choice A, $2^n - 1$. When you substitute $n = 1$ into the expression, it becomes $2^1 - 1$. Simplify this expression and check your answer with the table.

Hint 3:

$$2^1 - 1$$
$$2 - 1$$
$$1$$

The expression simplifies to 1.

According to the table, $a_n = 0$ when $n = 1$, but the expression $2^n - 1$ gives the result $a_n = 1$ when $n = 1$. Therefore, this expression cannot be correct. Check the remaining expressions.

Hint 4:

$a_n = (n - 1)^2$ for $n = 2$

$a_n = (2 - 1)^2$

$a_n = (1)^2$

$a_n = 1$

The expression $(n - 1)^2$ yields the result $a_n = 1$ when $n = 2$. This does not agree with the table, which states that $a_n = 3$ when $n = 2$, so this expression is not correct.

Hint 5:

$a_n = 3(n - 1)$ for $n = 3$

$a_n = 3(3 - 1)$

$a_n = 3(2)$

$a_n = 6$

The expression $3(n - 1)$ yields the result $a_n = 6$ when $n = 3$. This does not agree with the table, which states that $a_n = 8$ when $n = 3$, so this expression is not correct.

Hint 6:

$a_n = n^2 - 1$ for $n = 1$

$a_n = 1^2 - 1$

$a_n = 1 - 1$

$a_n = 0$

The expression $n^2 - 1$ yields the result $a_n = 0$ when $n = 1$, which agrees with the value in the table. Try this equation with the rest of the values of n in the table to see if it works for all the values of n.

Hint 7:

The table below shows the results you obtain if you substitute each given value of n into the expression $n^2 - 1$.

n	1	2	3	4	5	6
a_n	0	3	8	15	24	35
$n^2 - 1$	0	3	8	15	24	35

The expression $n^2 - 1$ works for all the values in the table. This is the correct expression. Select this answer.

86.) "12851 Hint Version (spring 2004 gr 10 no 15)" (Problem ID: 15370) RADIO_BUTTON [MA - 2004 - Spring - I5]

No knowledge components have been assigned

x	*y*
1	8
3	10
5	12
7	14
9	16

The above table represents a linear relationship between x and y. What is an equation for y in terms of x?

Answers: (Interface Type: RADIO_BUTTON)

✔ **A. y = x + 7**

✘ B. y = 2x + 4

✘ C. y = -x + 7

✘ D. y = 3x + 7

Hint 1:

The general equation for a linear relationship with y in terms of x is y = m*x + b. To write this equation we need to know the slope m and the y-intercept b.

Hint 2:

x	*y*
1	8
3	10
5	12
7	14
9	16

Every change of +2 for x corresponds to a change of +2 for y.

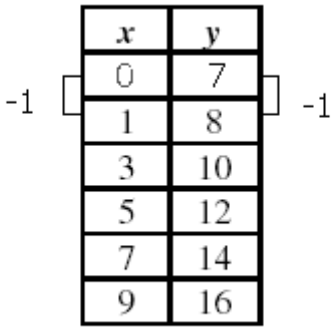
This means that every change of +1 for x corresponds to a change of +1 for y.

The slope is m = 1.

Hint 3:

The equation now becomes y = 1*x + b. The y-intercept is the y value when x = 0. Use the table to find the value of y when x = 0.

Hint 4:



To go from x = 1 to x = 0 the change is -1. Since the slope is 1, the change in y will also be -1 from y = 8 to y = 7.
The y-intercept is b = 7.
Hint 5:
Now that both m and b are known, you can find the correct equation. The equation takes the form y = mx + b, where m = 1 and b = 7.

The correct equation is y = x + 7. Select this answer.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

87.) "Spring_1999_27" (Problem ID: 13663) RADIO_BUTTON

No knowledge components have been assigned

A manufacturing company has 750 employees. It plans to increase its work force by 15 employees per month until it has doubled in size.
Which of the equations below will help you determine the number of months, m, it will take the company to double in size?

Answers: (Interface Type: RADIO_BUTTON)

✗ A) 750 + 15 = 2m
✗ B) 2(750) = 15m
✗ C) (750 + 15)2 = m
✓ **D) 750 + 15m = 2(750)**

(Problem ID: 13664) RADIO_BUTTON

No knowledge components have been assigned

The question tells us that the company will hire 15 new employees per month for m number of months. Which of the following expressions tells how many new employees were hired after m months have passed?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13665) RADIO_BUTTON

No knowledge components have been assigned

Good! We now know that the number of new employees over m months will be 15m. The current number of employees is 750, and the company wishes to double in size. Which expression shows how many people will be working if the company doubles in size?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13666) RADIO_BUTTON

No knowledge components have been assigned

Finally, lets set up an equation that allows us to solve for the number of months, m, it would take for the company to double in size. Which of the following expressions shows this?

Answers: (Interface Type: RADIO_BUTTON)

88.) "Spring_2000_36" (Problem ID: 13174) RADIO_BUTTON [MA - 2000 - Spring - 36]

No knowledge components have been assigned

Misha and his sister are using 5-foot and 8-foot landscaping timbers to enclose a vegetable garden. They bought 40 timbers. The total cost for the timbers was $288. Which pair of equations could be used to find the number of timbers of each size that they bought?

Answers: (Interface Type: RADIO_BUTTON)

✗ A) $6x + 9y = 40$ and $x + y = 288$

✗ B) $x + y = 40$ and $5x + 8y = 288$

✗ C) $5x + 8y = 40$ and $6x + 9y = 288$

✓ **D) $x + y = 40$ and $6x + 9y = 288$**

(Problem ID: 13175) RADIO_BUTTON [MA - 2000 - Spring - 36]

No knowledge components have been assigned

Since the sign tells us the price of each timber, we only need to know how many of each was purchased. Set up an equation that tells us the total number of timbers bought. (Use x as the number of 5-foot timbers bought and y as the number of 8-foot timbers bought)

Answers: (Interface Type: RADIO_BUTTON)

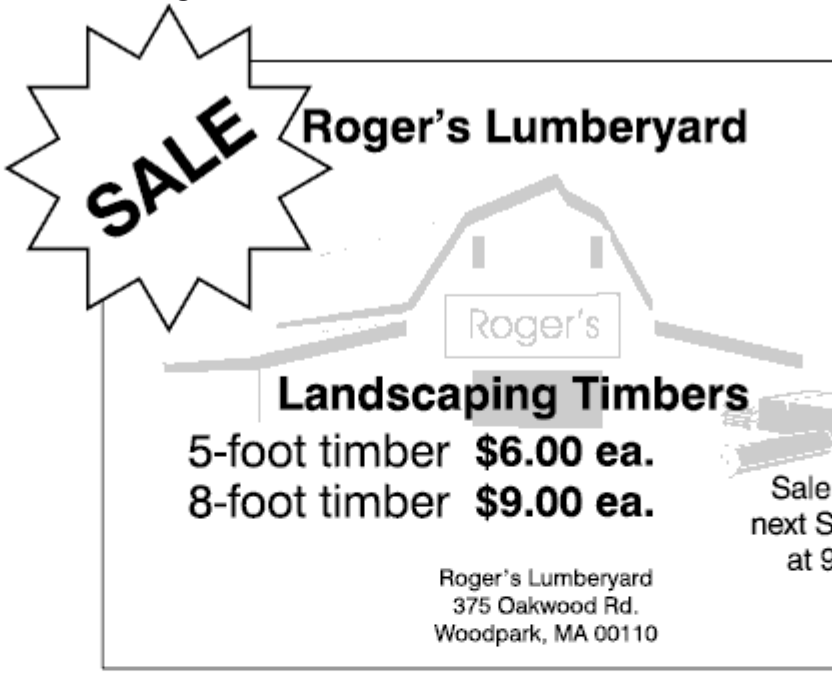
(Problem ID: 13176) RADIO_BUTTON [MA - 2000 - Spring - 36]

No knowledge components have been assigned

Terrific! Now that we have an equation for the number of timbers, we just need an equation for the cost of the timbers and we'll be done! Which of these equations shows the total cost of

the timbers.
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13177) RADIO_BUTTON [MA - 2000 - Spring - 36]
No knowledge components have been assigned



36. Misha and his sister are using 5-foot and 8-foot landscaping timbe
garden. They bought 40 timbers. The total cost for the timbers wa
equations could be used to find the number of timbers of each size

A. $6x + 9y = 40$ and $x + y = 288$

B. $x + y = 40$ and $5x + 8y = 288$

C. $5x + 8y = 40$ and $6x + 9y = 288$

D. $x + y = 40$ and $6x + 9y = 288$

Ok- Lets get back to the original question. Which pair of equations could be used to find the number of timbers of each size that Misha and his sister bought?
Answers: (Interface Type: RADIO_BUTTON)

89.) "March_2005_Retake_9_Hints" (Problem ID: 13494) RADIO_BUTTON [MA - 2001 - Spring - 24]
No knowledge components have been assigned

Bacteria Growth

Number of Hours' Growth	Total Number of Bacteria (in thousands)
0	1
1	2
2	4
3	8

In a laboratory experiment, the number of bacteria in a petri dish doubled every hour. The table above shows the total number of bacteria, in thousands, for the first 3 hours' growth. If the pattern established in the table continues, which of the following expressions best represents the total number of bacteria, in thousands, in the petri dish after t hours' growth?

Answers: (Interface Type: RADIO_BUTTON)

✗ A) $2t$

✗ B) $2t^2$

✓ **C) 2^t**

✗ D) t^2

Hint 1:
Substitute the choices and determine which one is true for all cases given in the table.

Hint 2:
Plugging in 0 for t immediately eliminates choice A because $(2 \times 0) = 0$. According to the table, at $t = 0$, The number of bacteria should be 1 thousand, not 0.

Hint 3:
Similarly, substituting zero for t can eliminate choice B because $(2 \times 0^2) = 0$. According to the table, at $t = 0$, The number of bacteria should be 1 thousand, not 0.

Hint 4:
In the same manner, choice D can also be eliminated because $(0^2) = 0$. According to the table, at $t = 0$, The number of bacteria should be 1 thousand, not 0.

Hint 5:
The only answer left is choice C. Substituting the values for t in the table are consistent with the number of bacteria. Thus the correct answer is C

90.) "March_2005_Retake_30" (Problem ID: 13519) RADIO_BUTTON [MA - 2005 - MAR - 30]

No knowledge components have been assigned

Kim observed that the price, in dollars, of a certain stock changed as follows.

- First the price increased by 4 dollars
- Second, the price decreased by 7 dollars
- Third, the price increased by 2 dollars
- Finally, the price tripled.

If x represents the original price, in dollars, of this stock, which of the following represents its final price?
Answers: (Interface Type: RADIO_BUTTON)
✗ x - 1
✗ x + 13
✗ 3(x + 13)
✓ **3(x - 1)**

(Problem ID: 13520) ALGEBRA_FIELD [MA - 2005 - MAR - 30]

No knowledge components have been assigned
The best way to solve this problem is to write down the price step by step in relation to the original. Since x represents the original price, how would you write that the price increased by $4?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13521) ALGEBRA_FIELD [MA - 2005 - MAR - 30]

No knowledge components have been assigned
Great! Now let's go to the next step. If the price then decreased by seven, what would the new expression be?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13522) ALGEBRA_FIELD [MA - 2005 - MAR - 30]

No knowledge components have been assigned
Almost there! Now it says the price increases by 2. What is the new expression?
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 13523) RADIO_BUTTON [MA - 2005 - MAR - 30]

No knowledge components have been assigned
Last step! Now the stock price triples. What is the final answer?
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

91.) "pre_2003_31c_10" (Problem ID: 15714) TEXT_FIELD [MA - 2003 - SPRING - 31c]

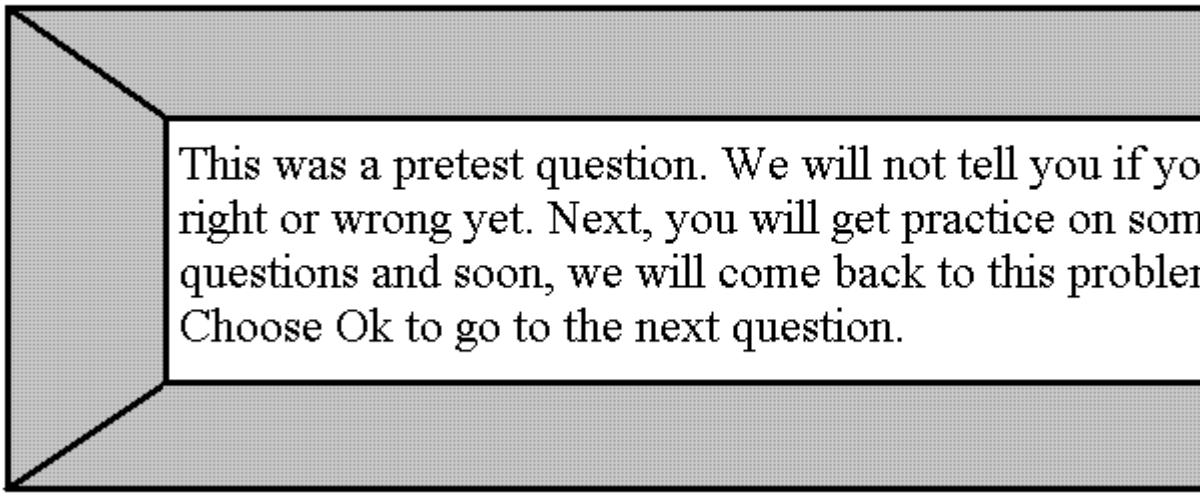
No knowledge components have been assigned
An art collector paid $7,000 for two paintings, a portrait and a landscape, at the same auction. Each painting cost $3,500.

The collector predicts that the value of the landscape painting will increase by 15% per year. If she is correct, what will its value be one year after the date of purchase?
Answers: (Interface Type: TEXT_FIELD)
✓ **$4025**
✓ **4025**
✓ **$4,025**

(Problem ID: 15715) RADIO_BUTTON [MA - 2003 - SPRING - 31c]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.

Answers: (Interface Type: RADIO_BUTTON)

92.) "pre_2004_8_10" (Problem ID: 15717) RADIO_BUTTON

No knowledge components have been assigned

A certain car averages 28 miles per gallon. Gasoline costs $1.11 per gallon. Which of the following is closest to the number of miles the car would be expected to go on $250 worth of gasoline?

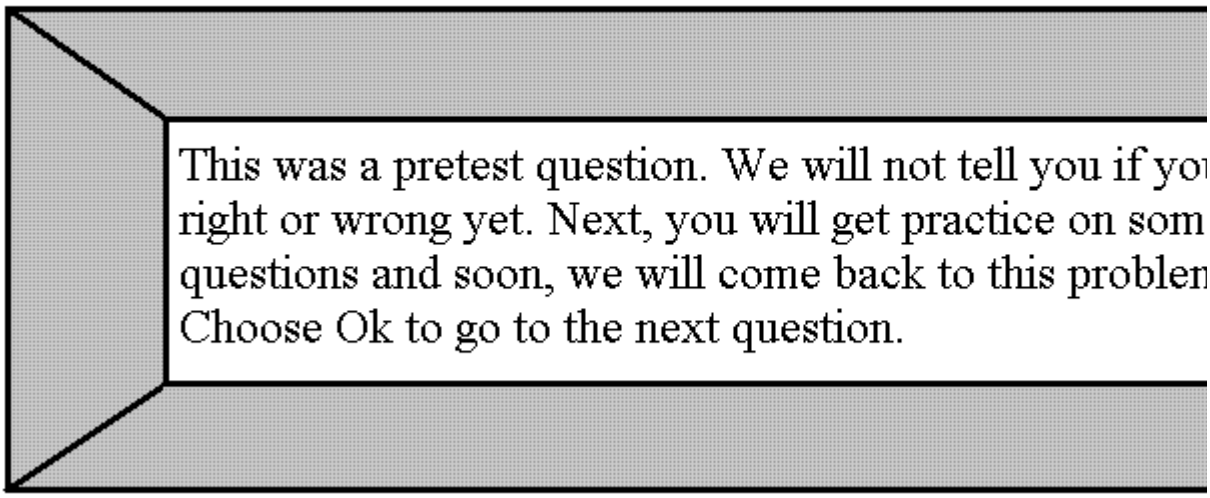
Answers: (Interface Type: RADIO_BUTTON)

✗ 400
✓ **6000**
✗ 12000
✗ 30000

(Problem ID: 15718) RADIO_BUTTON

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

93.) "Fall 2002 retest gr. 10 no. 37" (Problem ID: 15203) RADIO_BUTTON [MA - 2002 - FALL - 37]

No knowledge components have been assigned

Tykwan guides groups on nature trails. He is paid $15 per group for the short trail and $20 per group for the long trail. If 80% of Tykwan's groups take the short trail, what is the total number of groups he must guide to earn a total of $400?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 5
✗ B. 12
✗ C. 20
✓ **D. 25**

(Problem ID: 15204) ALGEBRA_FIELD [MA - 2002 - FALL - 37]

In order to find the total number of groups that Tykwan needs to guide, we need to set up an equation that can be solved for *n*, the total number of groups that he must guide. The first step is to determine how many groups took the short trail and how many groups took the long trail. If 80% of the groups took the short trail, what percent of groups took the long trail? (Do not type in the percent sign.)

(Problem ID: 15205) RADIO_BUTTON [MA - 2002 - FALL - 37]

We need to use these percentages to find expressions for actual number of groups that took each trail. There are a total of *n* groups, and 80% took the short trail whereas 20% took the long trail. Which of the following correctly describes how many groups took each path?

(Problem ID: 15206) RADIO_BUTTON [MA - 2002 - FALL - 37]

Now that we know that there are $0.8n$ groups that took the short trail and $0.2n$ groups that took the long trail, we can use the problem data to set up an equation that can be solved for n. Tykwan is paid \$15 per group for the short trail and \$20 per group for the long trail. If he makes \$400, which equation below is correct?

(Problem ID: 15207) RADIO_BUTTON [MA - 2002 - FALL - 37]

Now all you have to do is solve the equation $15(0.8n) + 20(0.2n) = 400$ for n. What is the value of n, the total number of groups he must guide?

94.) "November 2003 retest gr 10 no 22" (Problem ID: 14595) RADIO_BUTTON [MA - 2003 - NOV - 22]

No knowledge components have been assigned

A company bought a truck priced at \$50,000. If the truck loses \$2400 in value each year, after how many years will it be worth exactly \$30,800?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A. 8 years**
✗ B. 12 years
✗ C. 13 years
✗ D. 21 years

(Problem ID: 14596) ALGEBRA_FIELD [MA - 2003 - NOV - 22]

In order to find how many years it will take the truck to drop its value to \$30,800, you must first find out exactly how much value it has lost. The initial value is \$50,000 and the final value is \$30,800. What is the difference between the initial and final values, in dollars?

(Problem ID: 14597) RADIO_BUTTON [MA - 2003 - NOV - 22]

Now that you know the truck lost \$19,200 in value over an unknown number of years, use the fact that it loses \$2400 in value for every 1 year to find what the unknown number of years is. How many years will it take the truck to be worth \$30,800?

95.) "2004retest_15_gr10 (2006/09/28 02:00:22)" (Problem ID: 13629) TEXT_FIELD

No knowledge components have been assigned

Ellen works in the Hancock Building delivering parcels. She began her morning deliveries by riding the elevator down 9 floors, up 11 floors, up 5 floors, then down 10 floors where she got off on the 24th floor to take her break. On what floor did Ellen get on the elevator to begin her deliveries?

Answers: (Interface Type: TEXT_FIELD)

✓ **27**

(Problem ID: 13637) RADIO_BUTTON

To solve this problem we can create an equation to represent Ellen's path. Which of the following equations represents Ellen's path?

(Problem ID: 13638) TEXT_FIELD

Now that we have the equation that for the path Ellen took, we can solve for x in the equation to find out what floor Ellen started on. What floor did Ellen start on?

End Random Order Section Begin Random Order Section

96.) "15203 Hint Version (Fall 2002 retest gr. 10 no. 37)" (Problem ID: 15367) RADIO_BUTTON [MA - 2002 - FALL - 37]

No knowledge components have been assigned

Tykwan guides groups on nature trails. He is paid $15 per group for the short trail and $20 per group for the long trail. If 80% of Tykwan's groups take the short trail, what is the total number of groups he must guide to earn a total of $400?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 5
✗ B. 12
✗ C. 20
✓ **D. 25**

Hint 1:
In order to find the total number of groups that Tykwan needs to guide, we need to set up an equation that can be solved for n, the total number of groups that he must guide. If 80% of the groups took the short trail, then 20% of the groups took the long trail. Use this information set up the equation.

Hint 2:
These percentages need to be transformed into expressions for the actual number of groups that took each trail.

If 80% of the groups took the short trail, then a total of $0.8n$ groups took the short trail.

If 20% of the groups took the long trail, then a total of $0.2n$ groups took the long trail.

Hint 3:
Combine the following information into an equation that can be solved for n.

$0.8n$ groups took the short trail
$0.2n$ groups took the long trail
Tykwan makes $15 per group for the short trail
Tykwan makes $20 per group for the long trail
Tykwan makes a total of $400

Hint 4:
You have to multiply the number of groups that took the short trail, $0.8n$, by the amount Tykwan makes for each group he guides on the short trail, $15.

Tykwan makes $15(0.8n)$ dollars guiding groups on the short trail.

You then have to multiply the number of groups that took the long trail, $0.2n$, by the amount Tykwan makes for each group he guides on the long trail, $20.

Tykwan makes $20(0.2n)$ dollars guiding groups on the long trail.

Hint 5:
The sum of $15(0.8n)$ and $20(0.2n)$ must equal 400.

The equation that must be solved for n is $15(0.8n) + 20(0.2n) = 400$.
Hint 6:

Start by multiplying the numbers in front of the n's.

$$15(0.8n) + 20(0.2n) = 400$$
$$12n + 4n = 400$$

false
Hint 7:

Next combine like terms.

$$15(0.8n) + 20(0.2n) = 400$$
$$12n + 4n = 400$$
$$16n = 400$$

false
Hint 8:

Now divide both sides by 16.

$$15(0.8n) + 20(0.2n) = 400$$
$$12n + 4n = 400$$
$$\frac{16n}{16} = \frac{400}{16}$$
$$n = 25$$

Tykwan must guide a total of 25 groups to make $400. Select this answer.

97.) "14595 Hint Version (November 2003 retest gr 10 no 22)" (Problem ID: 15368) RADIO_BUTTON [MA - 2003 - NOV - 22]

No knowledge components have been assigned

A company bought a truck priced at $50,000. If the truck loses $2400 in value each year, after how many years will it be worth exactly $30,800?

Answers: (Interface Type: RADIO_BUTTON)

✔ **A. 8 years**
✘ B. 12 years
✘ C. 13 years
✘ D. 21 years

Hint 1:
In order to find how many years it will take the truck to drop its value to $30,800, you must first find out exactly how much value it has lost. The initial value is $50,000 and the final value is $30,800. Find the difference between these values.

Hint 2:
$50,000 - $30,800 = $19,200
The truck has lost $19,200 in value.
Hint 3:
Now that you know the truck lost $19,200 in value over an unknown number of years, use the fact that it loses $2400 in value for every 1 year to find what the unknown number of years is.
Hint 4:

$$\frac{\$19,200}{\$2,400/\text{year}} = 8 \text{ years}$$

It takes 8 years for the truck to be worth $30,800. Select this answer.

98.) "2004retest_15_gr10_hint (2007/01/06 13:26:44)" (Problem ID: 15638) ALGEBRA_FIELD [MA - 2004 - NOV - 15]

No knowledge components have been assigned

Ellen works in the Hancock Building delivering parcels. She began her morning delivers by riding the elevator down 9 floors, up 11 floors, up 5 floors, then down 10 floors where she got off on the 24th floor to take her break. On what floor did Ellen get on the elevator to begin her deliveries?

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **27**

Hint 1:
To solve this problem we want to build an equation that represents the path Ellen took. To build to the equation you start with the floor Ellen began on, add the floors Ellen went up, subtract the floors she goes down, and that will equal the final floor she ends on.
Hint 2:
Use *x* to represent the floor Ellen started on and use the table below to interpret the elevator rides Ellen took.

Down 9 floors	-9
Up 11 floors	+11
Up 5 floors	+5
Down 10 floors	-10

Hint 3:
The equation that represents Ellen's path is

x - 9 + 11 + 5 - 10 = 24

Now solve for *x* in the equation to find out which floor Ellen started on.
Hint 4:
Add all the terms on the left side of the equation to get a single value. It may help to rewrite the subtraction as addition with a negative number. Then you can add in any order you want.

x - 9 +11 + 5 -10 = 24
x +(-9) +11 + 5 +(-10) = 24
x + 2 + 5 +(-10) = 24
x + 7 +(-10) = 24

x - 3 = 24
Now solve for x.
Hint 5:
x - 3 = 24
x - 3 + 3 = 24 + 3
x = 27
Ellen started on floor 27. Type in 27.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

99.) "2003_31c_gr10 (2006/09/12 23:27:05)" (Problem ID: 12813) TEXT_FIELD [MA - 2003 - SPRING - 31c]

No knowledge components have been assigned

An art collector paid $7,000 for two paintings, a portrait and a landscape, at the same auction. Each painting cost $3,500.

The collector predicts that the value of the landscape painting will increase by 15% per year. If she is correct, what will its value be one year after the date of purchase?

Answers: (Interface Type: TEXT_FIELD)

✓ **4025**

(Problem ID: 12814) ALGEBRA_FIELD [MA - 2003 - SPRING - 31c]

No knowledge components have been assigned

To calculate the predicted value of the painting after a year, we first need to calculate how much the value of the landscape painting will increase in one year. Since we expect the painting's value to increase by 15%. What is 15% of the original value?

Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 12815) TEXT_FIELD [MA - 2003 - SPRING - 31c]

No knowledge components have been assigned

Now that we know the expected increase in value of the landscape painting after a year is $525, what will the predicted value be after a year?

Answers: (Interface Type: TEXT_FIELD)

100.) "2004_8_gr10 (2006/09/21 10:34:32)" (Problem ID: 13130) RADIO_BUTTON

No knowledge components have been assigned

A certain car averages 28 miles per gallon. Gasoline costs $1.11 per gallon. Which of the following is closest to the number of miles the car would be expected to go on $250 worth of gasoline?

Answers: (Interface Type: RADIO_BUTTON)

✓ **6000**
✗ 12000
✗ 400
✗ 30000

(Problem ID: 13143) RADIO_BUTTON

No knowledge components have been assigned

To solve this problem we need to find out how many gallons of gasoline can be purhased with $250 and then find how many miles can the car travel. We know gasoline costs $1.11 per gallon. So which value is the best estimate for the number of gallons that can be purchased for $250?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13144) RADIO_BUTTON

No knowledge components have been assigned

Using the estimate of 250 gallons of gasoline, about how many miles could the car travel with an average of $28 per gallon. Which value is your estimate closest to?

Answers: (Interface Type: RADIO_BUTTON)

101.) "2004_9_gr10 (2006/09/21 13:11:06)" (Problem ID: 13156) RADIO_BUTTON

No knowledge components have been assigned

The Sun is approximately 93,000,000 miles from Earth. Light travels approximately 186,000 miles per second.

Which of the following is **closest** to the number of seconds it takes light to travel from the Sun to Earth?

Answers: (Interface Type: RADIO_BUTTON)

✗ 0.005
✗ 0.050
✓ **500**
✗ 5000

(Problem ID: 13157) RADIO_BUTTON

No knowledge components have been assigned

In this problem we want to estimate the number of seconds it takes for light to travel to Earth. We can use the formula

time = distance / speed

and substitute approximate values in for the distance and speed. Lets start by estimating the distance. Which of the following values is close estimate of the distance?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13164) RADIO_BUTTON

No knowledge components have been assigned

Now that we have an estimate for the distance the light must travel, we need an estimate for the speed of light. Which of the following is closest to the speed of light, 186,000?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13165) RADIO_BUTTON

No knowledge components have been assigned

Now that we have some approximate values (100,000,000 miles and 200,000 miles per hour), we should be able to easily estimate how long it will take light to travel from the Sun to Earth. Using the new values in the formula for time, find out how long it will take. Which of the following is **closest** to the number of seconds it takes light to travel from the Sun to Earth?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section
nd Linear Section

Module Name: 10thGradeNumberSense_IQP

Questions Only Answer Key Printout for Students **Full Details**

Begin Linear Section
Begin Linear Section
Begin Random Order Section

1.) "pre_2001_4_gr10" (Problem ID: 21220) RADIO_BUTTON [MA - 2001 - Spring - 4]

No knowledge components have been assigned

$2^4 * 3^4$ is the same as

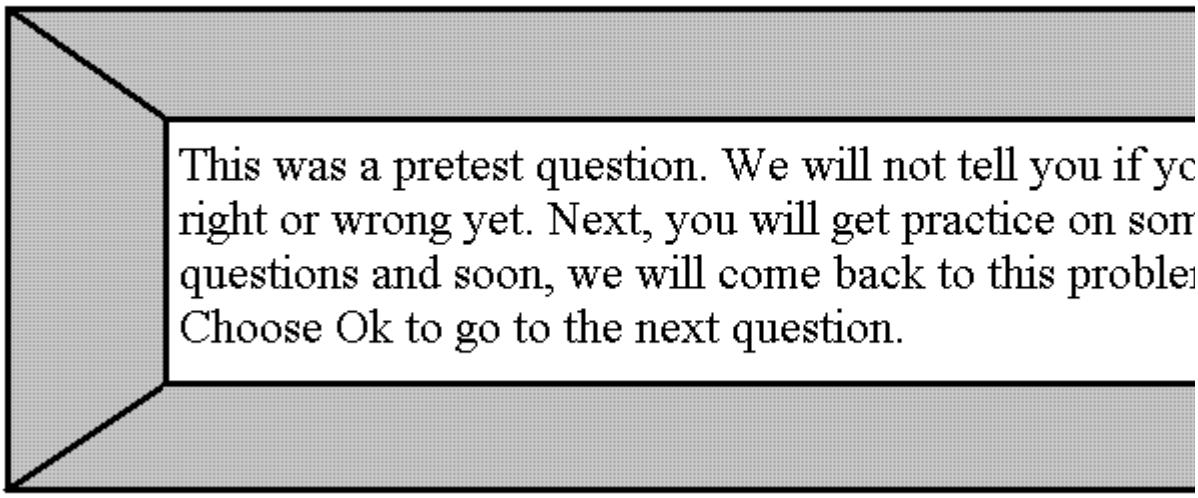
Answers: (Interface Type: RADIO_BUTTON)

✗ 5^8
✗ 5^4
✗ 6^8
✓ **6^4**

(Problem ID: 21240) RADIO_BUTTON [MA - 2001 - Spring - 4]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.

Answers: (Interface Type: RADIO_BUTTON)

2.) "pre_2006_18_gr10" (Problem ID: 21241) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

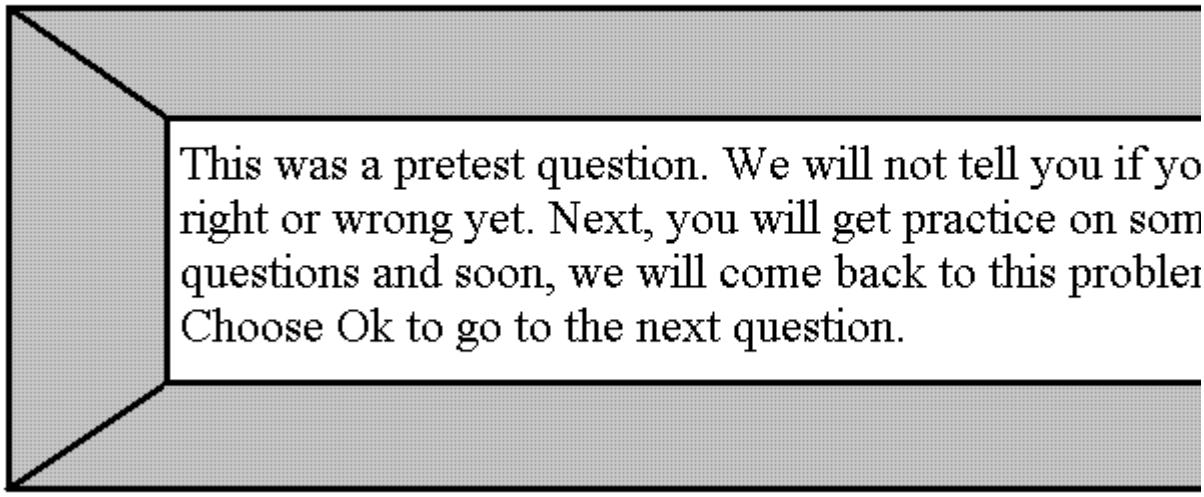
What is the value of the expression $(\sqrt{5})^2$.

Answers: (Interface Type: TEXT_FIELD)
✓ **5**

(Problem ID: 21242) RADIO_BUTTON [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

3.) "2004retest_12_gr10 (2006/09/28 01:24:16)" (Problem ID: 13599) RADIO_BUTTON

No knowledge components have been assigned

Which is closest to $2 * 9^5$?
Answers: (Interface Type: RADIO_BUTTON)
✗ 10,000
✓ **100,000**
✗ 1,000,000
✗ 1,000

(Problem ID: 13612) RADIO_BUTTON

In this problem, we need to estimate the value of $2 * 9^5$. Start by trying to approximate the value of 9^5. Which of the following is closest to the value of 9^5?

(Problem ID: 13613) RADIO_BUTTON

We now have simplified the expression to 2 * 100000. We can now go back to the original question and which of the original values is closest to the value of this expression?

4.) "2003retest_15_gr10 (2006/11/24 22:36:34)" (Problem ID: 15005) ALGEBRA_FIELD [MA - 2003 - NOV - 15]

No knowledge components have been assigned

For what value of n is the equation below true?

$5^4 * n = 5^7$

Answers: (Interface Type: ALGEBRA_FIELD)

✔ **125**

(Problem ID: 15006) RADIO_BUTTON [MA - 2003 - NOV - 15]

Let's start by breaking apart 5^4 into the individual factors of 5, which are multiplied together. Which of the answers below is another way of writing 5^4?

(Problem ID: 15007) RADIO_BUTTON [MA - 2003 - NOV - 15]

If we use the same procedure on 5^7 we would get get 5*5*5*5*5*5*5. Now we can compare 5^4 and 5^7 in their rewritten form to find out the value of n. Which expression is equal to n?

$5^4 * n = 5^7$

5*5*5*5 * n = 5*5*5*5*5*5*5

(Problem ID: 15008) ALGEBRA_FIELD [MA - 2003 - NOV - 15]

In the previous question we found that n = 5*5*5, but we want to get a single number value for n to answer the original question. For what value of n is the equation below true?

$5^4 * n = 5^7$

End Random Order Section Begin Random Order Section

5.) "2004retest_12_gr10_hint (2007/01/06 13:12:13)" (Problem ID: 15636) RADIO_BUTTON

No knowledge components have been assigned

Which is closest to $2 * 9^5$?

Answers: (Interface Type: RADIO_BUTTON)

✘ A. 1,000

✘ B. 10,000

✔ **C. 100,000**

✘ D. 1,000,000

Hint 1:

In this problem we need to estimate the value of $2 * 9^5$. Start by trying to approximate the value of 9^5.

Hint 2:

Since 9^5 is very large, we can get a estimate the value by using 10 instead of 9. Estimate

10^{10}.
Hint 3:
$10^5 = 100{,}000$.

Now if we substitute this estimate into the original expression we get

2 * 100,000

Now find the value of the entire expression and look for that answer which is closest to our estimate.
Hint 4:
2 * 100,000 = 200,000

Our estimate of 200,000 is closest to 100,000. Select C.

6.) "2003retest_15_gr10_hint (2007/01/06 21:32:37)" (Problem ID: 15646) ALGEBRA_FIELD [MA - 2003 - NOV - 15]

No knowledge components have been assigned
For what value of n is the equation below true?

$5^4 * n = 5^7$
Answers: (Interface Type: ALGEBRA_FIELD)
✔ **125**
Hint 1:
Let's start by breaking apart 5^4 into the individual factors of 5, which are multiplied together. We can rewrite 5^4 as 5*5*5*5 if we expand the exponent. We can also do the same for 5^7.
Hint 2:
$5^7 = 5*5*5*5*5*5*5$

Now that we have rewritten both of these exponents, we can substitute these into the equation.

5*5*5*5 * n = 5*5*5*5*5*5*5
Hint 3:
If we replace n with 5*5*5 the equation becomes true.

5*5*5*5 * 5*5*5 = 5*5*5*5*5*5*5

5*5*5 = 125. Type in 125.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

7.) "2001_4_gr10_scaffold (2006/09/27 14:04:41)" (Problem ID: 13389) RADIO_BUTTON [MA - 2001 - Spring - 4]

No knowledge components have been assigned
$2^4 * 3^4$ is the same as
Answers: (Interface Type: RADIO_BUTTON)
✘ 5^8

✗ 5^4
✗ 6^8
✓ **6^4**

(Problem ID: 13390) RADIO_BUTTON [MA - 2001 - Spring - 4]

No knowledge components have been assigned

Lets try to do this by expanding the problem and then simplifying it afterward. Which of the following is equal to $2^4 * 3^4$.

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13391) RADIO_BUTTON [MA - 2001 - Spring - 4]

No knowledge components have been assigned

When (2 * 2 * 2 * 2) * (3 * 3 * 3 * 3) is simplified what does it equal?

Answers: (Interface Type: RADIO_BUTTON)

8.) "2006_18_gr10_hints (2006/11/02 12:58:42)" (Problem ID: 14557) TEXT_FIELD [MA - 2006 - SPRING - 18]

No knowledge components have been assigned

What is the value of the expression $(\sqrt{\ }5)^2$.

Answers: (Interface Type: TEXT_FIELD)

✓ **5**

Hint 1:

Remember that the square root and the square cancel out.

Hint 2:

This leaves just the 5. Please enter 5.

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

9.) "pre_2002_11r_gr10" (Problem ID: 21260) RADIO_BUTTON [MA - 2002 - Fall - 11]

No knowledge components have been assigned

Oldwick High School has a population of 2345 students. A survey showed that 34% of the student population would like to have hamburgers as a daily choice for lunch. Which of the following is closest to 34% of the student population?

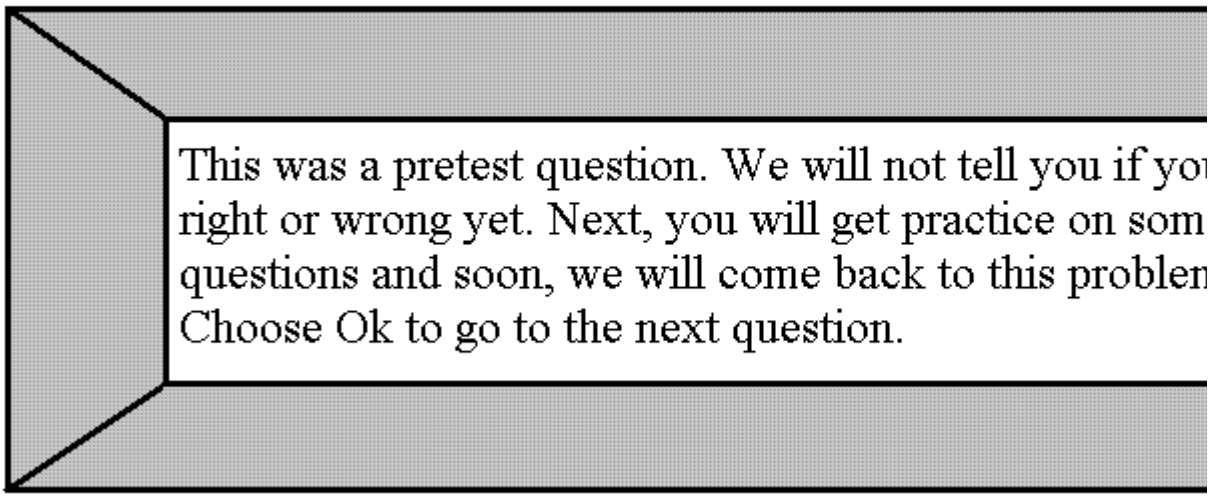
Answers: (Interface Type: RADIO_BUTTON)

✗ 340
✓ **800**
✗ 1200
✗ 1600

(Problem ID: 21261) RADIO_BUTTON [MA - 2002 - Fall - 11]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

10.) "pre_2002_36r_gr10" (Problem ID: 21264) RADIO_BUTTON [MA - 2002 - Fall - 36]

No knowledge components have been assigned

Garvin made 16 quarts of punch for a party. He mixed juice and ginger ale in a ratio of 3:1. He did not like the taste, so he added 4 more quarts of ginger ale to the punch. The ratio of juice to ginger ale was then which of the following?

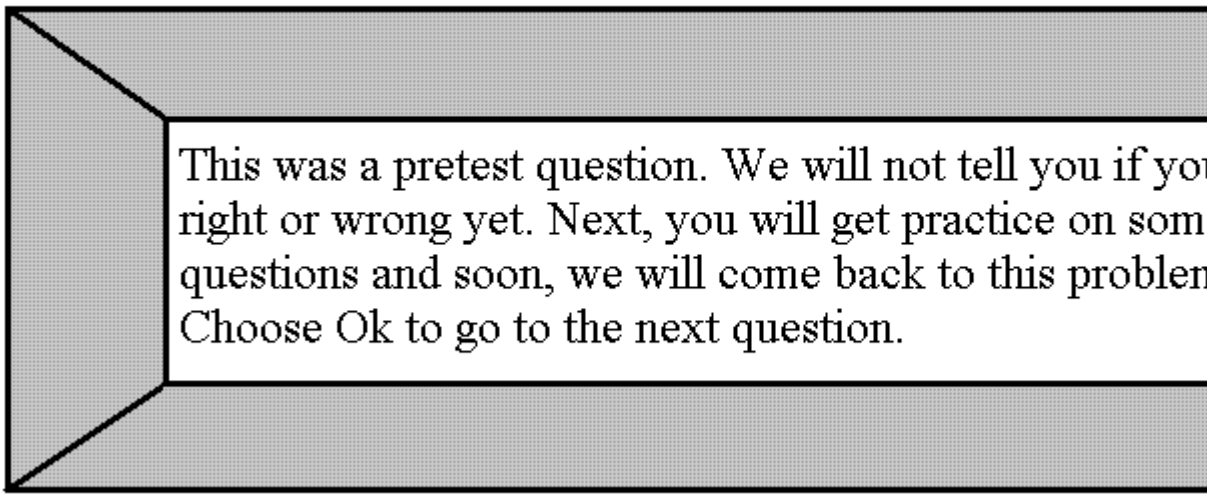
Answers: (Interface Type: RADIO_BUTTON)

✗ 1:1
✗ 2:3
✓ **3:2**
✗ 3:1

(Problem ID: 21265) RADIO_BUTTON [MA - 2002 - Fall - 36]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

11.) "2003retest_23_gr10 (2006/11/25 03:19:40)" (Problem ID: 15012) RADIO_BUTTON [MA - 2003 - NOV - 23]

No knowledge components have been assigned

Jason wants to make enough chili to serve 26 people. His recipe serves 6 people and requires 13 ounces of water. Based on this recipe, how many ounces of water are required to serve 26 people?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 3

✗ B. $43\ ^{1}/_{3}$

✓ **C. $56\ ^{1}/_{3}$**

✗ D. 78

(Problem ID: 15013) RADIO_BUTTON [MA - 2003 - NOV - 23]

A. $\frac{6}{13} = \frac{x}{26}$

B. $\frac{13}{6} = \frac{26}{x}$

C. $\frac{13}{26} = \frac{x}{6}$

D. $\frac{13}{6} = \frac{x}{26}$

In this problem we want to create a ratio that relates the amount of water needed to the amount of people the recipe serves. Once we have this ratio we can use it to calculate the amount of water needed to serve a different number of people. Remember that the recipe

requires 13 ounces of water and serves 6 people but Jason wants to serve 26 people. Which of the ratios above correctly represents the ratio of ounces of water to people served?

(Problem ID: 15014) RADIO_BUTTON [MA - 2003 - NOV - 23]

Now using the ratio above, we can calculate the ounces of water needed to serve 26 people by solving for x. How many ounces of water are needed to serve 26 people?

12.) "2004_40_gr10(calculator) (2006/09/26 13:19:34)" (Problem ID: 13336) RADIO_BUTTON

No knowledge components have been assigned

Bailey noticed that many of the students at her school had red hair. She randomly chose 25 of the students in her school and found that 2 of them had red hair. If Baileys sample is representative, which of the following is closest to the number of the 2200 students at her school who have red hair?

Answers: (Interface Type: RADIO_BUTTON)

✓ **176**
✗ 44
✗ 200
✗ 88

(Problem ID: 13337) RADIO_BUTTON

To solve this problem let's try to setup a proportion that represents the sample of students and all the students in the school who have red hair. Which of the answers is the correct proportion?

(Problem ID: 13338) RADIO_BUTTON

$$\frac{25}{2} = \frac{2200}{x}$$

Now that we have a proportion which represents the number of students with red hair in the sample and in the entire school, we can solve for x to find out how many students in the school have red hair. How many students have red hair?

End Random Order Section Begin Random Order Section

13.) "2003retest_23_gr10_calculator_hint (2007/01/07 12:52:49)" (Problem ID: 15648) RADIO_BUTTON [MA - 2003 - NOV - 23]

No knowledge components have been assigned

Jason wants to make enough chili to server 26 people. His recipe serves 6 people and requires 13 ounces of water. Based on this recipe, how many ounces of water are required to serve 26 people?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 3
✗ B. $43\ ^{1}/_{3}$
✓ **C. $56\ ^{1}/_{3}$**
✗ D. 78

Hint 1:

$$\frac{\text{Ounces of water}}{\text{People Served}}$$

In this problem we want to create a ratio that relates the amount of water needed to the amount of people the recipe serves. To setup the ratio we need two fractions that follow the format above and to set them equal to each other.

Hint 2:

$$\frac{13}{6} = \frac{x}{26}$$

Since we know that the recipe needs 13 ounces of water and serves 6 people we get the fraction on the left. Then if we use x in place of the amount of ounces of water needed to serve 26 people, we get the fraction on the left. Now we can solve this ratio for x to find out how many ounces of water are needed to server 26 people.

Hint 3:

$$\frac{13}{6} = \frac{x}{26}$$

$$26 \times \frac{13}{6} = \frac{x}{26} \times 26$$

$$26 \times \frac{13}{6} = x$$

Now we have isolated x on one side of the equation and can calculate how many ounces of water are needed to serve 26 people.

Hint 4:

$$x = 26 \times \frac{13}{6}$$

$$x = 56\frac{1}{3}$$

When you perform the calculations, you find that it takes $56\ ^{1}/_{3}$ ounces of water to serve 26 people. Select C.

14.) "2004_40_gr10_hint (2007/01/04 21:40:42)" (Problem ID: 15632) RADIO_BUTTON

No knowledge components have been assigned

Bailey noticed that many of the students at her school had red hair. She randomly chose 25 students in her school and found that 2 of them had red hair. If Bailey's sample is representative, which of the following is closest to the number of 2200 students at her school who have red hair?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 44
✗ B. 88
✓ **C. 176**
✗ D. 200

Hint 1:
To solve this problem we can setup a proportion that relates the sample of students to all of the students in the school. To setup the proportion, we want to divide the whole by the part, the number of students with red hair, by the whole, the number of students in the group for both the sample and all the students in the school.
Hint 2:
For the sample, the part is 2 students with red hair and the whole is 25 students. For the entire school, the part of students that have red hair can be represented by x, and whole is 2200 students.
Hint 3:
$$\frac{25}{2} = \frac{2200}{x}$$
If we create two fractions and set the equal to each other we get the ratio above. Now that we have the ratio, we can solve for x to find estimate the number of students in the school who have red hair. Solve for x in the equation.
Hint 4:
$$\frac{25}{2} = \frac{2200}{x}$$
$$x\left(\frac{25}{2}\right) = \left(\frac{2200}{x}\right)x$$
$$\frac{25x}{2} = 2200$$
$$\frac{25x}{25} = \frac{4400}{25}$$
$x = 176$

If Baileys sample is representative, 176 students at her school have red hair. Select C.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

15.) "2002_11R_gr10_scaffold (2006/09/25 11:41:16)" (Problem ID: 13249) RADIO_BUTTON [MA - 2002 - Fall - 11]

No knowledge components have been assigned
Oldwick High School has a population of 2345 students. A survey showed that 34% of the student population would like to have hamburgers as a daily choice for lunch. Which of the following is closest to 34% of the student population?
Answers: (Interface Type: RADIO_BUTTON)
✗ 340
✓ **800**
✗ 1200
✗ 1600

(Problem ID: 13250) RADIO_BUTTON [MA - 2002 - Fall - 11]

No knowledge components have been assigned
Lets find some easy numbers to use for the percentage and number of students that was described. What is the closest fraction to 34%?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13295) RADIO_BUTTON [MA - 2002 - Fall - 11]

No knowledge components have been assigned
Now we need to find a number that is close to 2345. Which of the following is divisible by 3 and is close to 2345?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13296) RADIO_BUTTON [MA - 2002 - Fall - 11]

No knowledge components have been assigned
Now we can use our estimates to find the approximate number of students. What is the closest estimate for 34% of 2345?
Answers: (Interface Type: RADIO_BUTTON)

16.) "2002_36R_gr10_scaffold (2006/09/26 17:54:22)" (Problem ID: 13364) RADIO_BUTTON [MA - 2002 - Fall - 36]

No knowledge components have been assigned
Garvin made 16 quarts of punch for a party. He mixed juice and ginger ale in a ratio of 3:1. He did not like the taste, so he added 4 more quarts of ginger ale to the punch. The ratio of juice to ginger ale was then which of the following?
Answers: (Interface Type: RADIO_BUTTON)
✗ 1:1
✗ 2:3
✓ **3:2**
✗ 3:1

(Problem ID: 13381) TEXT_FIELD [MA - 2002 - Fall - 36]

No knowledge components have been assigned
First let's find out how many quarts of juice and ginger ale are in the punch. This will allow us to find the new ratio once we add in the extra 4 quarts of ginger ale. How many quarts of juice are in the punch?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 13382) TEXT_FIELD [MA - 2002 - Fall - 36]

No knowledge components have been assigned
Now how many quarts of ginger ale are there?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 15534) RADIO_BUTTON [MA - 2002 - Fall - 36]

No knowledge components have been assigned
Now we know that there were 12 quarts of juice and 4 quarts of ginger ale. If we add in 4

quarts of ginger ale like the problem said, what is the new ratio of juice to ginger ale?
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

17.) "pre_2004_10_10_R" (Problem ID: 15685) RADIO_BUTTON [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Which of the following is equivalent to the expression below?

(3x + 6y) + (2x - y)

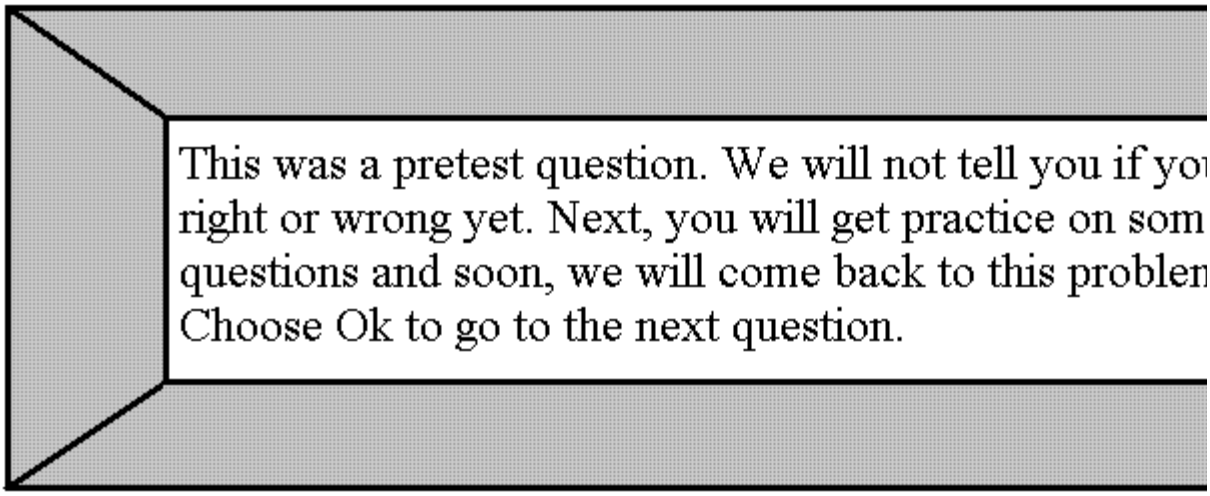
Answers: (Interface Type: RADIO_BUTTON)

✗ A) 5x - y
✗ B) 5x + 7y
✗ C) 6x - 6y
✓ **D) 5x + 5y**

(Problem ID: 15686) RADIO_BUTTON [MA - 2004 - NOVEMBER - 10]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.
Answers: (Interface Type: RADIO_BUTTON)

18.) "pre_2004_27_10_R" (Problem ID: 15689) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

$$\frac{24x^2 - 40x^3}{8x}$$

For all values of x other than zero, which of the following expressions is equivalent to the one shown above?

Answers: (Interface Type: RADIO_BUTTON)

✓ **A) $3x - 5x^2$**

✗ B) $3x - 40x^2$

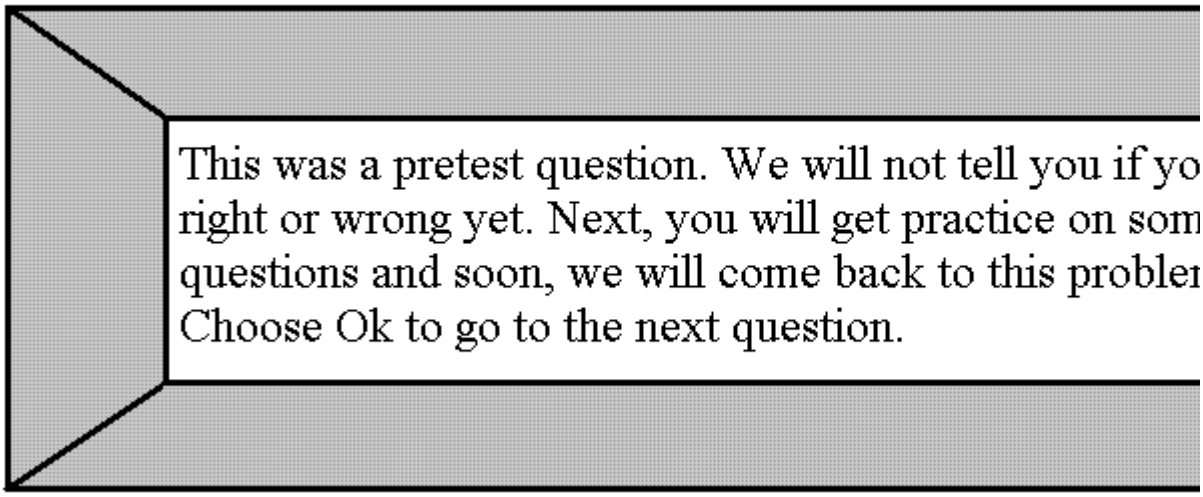
✗ C) $-2x^2$

✗ D) $-16x^2$

(Problem ID: 15690) RADIO_BUTTON [MA - 2004 - NOV - 27]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Select Ok and click Submit to continue.

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section

Begin Random Order Section

19.) "2004_8_gr10 (2006/09/21 10:34:32)" (Problem ID: 13130) RADIO_BUTTON

No knowledge components have been assigned

A certain car averages 28 miles per gallon. Gasoline costs $1.11 per gallon. Which of the following is closest to the number of miles the car would be expected to go on $250 worth of gasoline?

Answers: (Interface Type: RADIO_BUTTON)

✓ **6000**

✗ 12000

✗ 400

✗ 30000

(Problem ID: 13143) RADIO_BUTTON

To solve this problem we need to find out how many gallons of gasoline can be purhased with $250 and then find how many miles can the car travel. We know gasoline costs $1.11

per gallon. So which value is the best estimate for the number of gallons that can be purchased for $250?

(Problem ID: 13144) RADIO_BUTTON

Using the estimate of 250 gallons of gasoline, about how many miles could the car travel with an average of $28 per gallon. Which value is your estimate closest to?

20.) "2003retest_24_gr10_(calculator) (2006/11/26 11:29:58)" (Problem ID: 15029) RADIO_BUTTON [MA - 2003 - NOV - 24]

No knowledge components have been assigned

A jet airplane travels 1200 miles in 2.5 hours. At this rate, how far will it travel in 3 hours?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 1000
✓ **B. 1440**
✗ C. 1800
✗ D. 3600

(Problem ID: 15030) RADIO_BUTTON [MA - 2003 - NOV - 24]

A. $\frac{x}{3} = \frac{2.5}{1200}$

B. $\frac{x}{1200} = \frac{2.5}{3}$

C. $3x = \frac{1200}{2.5}$

D. $\frac{x}{3} = \frac{1200}{2.5}$

In this problem we need to find out how many miles the plane will travel in three hours using the fact that the plane travels 1200 miles in 2.5 hours. Let's setup a ratio which relates the distance traveled in 2.5 hours with the distance traveled in 3 hours. Which of the ratios above correctly relates distance traveled in 2.5 hours to the distance traveled in 3 hours?

(Problem ID: 15031) RADIO_BUTTON [MA - 2003 - NOV - 24]

Now that we have the ratio above, we can solve for x to find the distance traveled in 3 hours by a jet airplane. How far will it travel in 3 hours?

21.) "2004_9_gr10 (2006/09/21 13:11:06)" (Problem ID: 13156) RADIO_BUTTON

No knowledge components have been assigned

The Sun is approximately 93,000,000 miles from Earth. Light travels approximately 186,000 miles per second.

Which of the following is **closest** to the number of seconds it takes light to travel from the Sun to Earth?

Answers: (Interface Type: RADIO_BUTTON)

✗ 0.005
✗ 0.050
✓ **500**
✗ 5000

(Problem ID: 13157) RADIO_BUTTON

In this problem we want to estimate the number of seconds it takes for light to travel to Earth. We can use the formula

time = distance / speed

and substitute approximate values in for the distance and speed. Lets start by estimating the distance. Which of the following values is close estimate of the distance?

(Problem ID: 13164) RADIO_BUTTON

Now that we have an estimate for the distance the light must travel, we need an estimate for the speed of light. Which of the following is closest to the speed of light, 186,000?

(Problem ID: 13165) RADIO_BUTTON

Now that we have some approximate values (100,000,000 miles and 200,000 miles per hour), we should be able to easily estimate how long it will take light to travel from the Sun to Earth. Using the new values in the formula for time, find out how long it will take. Which of the following is **closest** to the number of seconds it takes light to travel from the Sun to Earth?

End Random Order Section Begin Random Order Section

22.) "2004_8_gr10_hint (2006/12/31 14:39:17)" (Problem ID: 15541) RADIO_BUTTON

No knowledge components have been assigned

A certain car averages 28 miles per gallon. Gasoline costs $1.11 per gallon. Which of the following is closest to the number of miles the car would be expected to go on $250 worth of gasoline?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 400
✓ **B. 6000**
✗ C. 12000
✗ D. 30000

Hint 1:

In this problem we want to use estimation to help us perform the calculations. Pick numbers to use as estimates for the price of gas, $1.11, and for the average miles per gallon the car travels, 28.

Hint 2:
Let's use $1.00 instead of $1.11 as the cost of a gallon of gasoline and 30 miles per gallon instead of 28.
Hint 3:
We can now calculate the how much gasoline can be bought by dividing the amount of money by the cost per gallon.
250 / 1.00 = 250 gallons of gasoline.
Hint 4:
Now we that we have estimated 250 gallons of gasoline, we can use it estimate how many miles the could could travel. Mutliply the miles per gallon the car can travel by the gallons of gasoline.
30 * 250 = 7500
6000 miles is closest to our estimate of 7500 miles.

23.) "2003retest_24_gr10_calculator_hint (2007/01/07 12:59:29)" (Problem ID: 15649) RADIO_BUTTON [MA - 2003 - NOV - 24]

No knowledge components have been assigned

A jet airplane travels 1200 miles in 2.5 hours. At this rate, how far will it travel in 3 hours?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 1000
✓ **B. 1440**
✗ C. 1800
✗ D. 3600

Hint 1:
In this problem we need to find out how many miles the plane will travel in three hours using the fact that the plane travels 1200 miles in 2.5 hours. Lets setup a ratio that relates the distance traveled in 2.5 miles with the distance traveled in 3 hours.
Hint 2:

$$\frac{1200}{2.5}$$

On one side of the ratio we can setup a fraction that represents the distance traveled by the plane in 2.5 hours. The fraction has the distance traveled 1200 miles as the numerator and the time of 3 hours as te denominator. Now setup the fraction that represents the distance traveled in 3 hours.
Hint 3:

$$\frac{x}{3} = \frac{1200}{2.5}$$

If we use x to represent the unknown distance, we get the other fraction for the distance traveled in 3 hours. Then you can set these two fractions equal to each other to create the ratio. Now we need to isolate x in the ratio to find the distance the jet airplane will travel in 3 hours.
Hint 4:

$$\frac{x}{3} = \frac{1200}{2.5}$$

$$3 \times \frac{x}{3} = \frac{1200}{2.5} \times 3$$

$$x = \frac{1200 \times 3}{2.5}$$

To start we just need to multiply both sides of the equation by 3.

Hint 5:

$$x = \frac{1200 \times 3}{2.5}$$

$$x = \frac{3600}{2.5}$$

$$x = 1440$$

We can then just use a calculator to evaluate the expression. We find that the distance the jet plane will travel in 3 hours is 1440 miles. Select B.

24.) "2004_9_gr10_hint (2006/12/31 15:19:07)" (Problem ID: 15542) RADIO_BUTTON

No knowledge components have been assigned

The Sun is approximately 93,000,000 miles from Earth. Light travels approximately 186,000 miles per second.

Which of the following is **closest** to the number of seconds it takes light to travel from the Sun to Earth?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 0.005
✗ B. 0.050
✓ **C. 500**
✗ D. 5000

Hint 1:

In this problem we want to estimate the number of seconds it takes for light to travel from the Sun to Earth. We can use the formulate below in our calculations.

time = distance / speed

Select some numbers to that use as estimates for the distance from the Sun to Earth and for the speed of light.

Hint 2:

Use the value 100,000,000 miles for the distance from the Sun to Earth and 200,000 miles per

our for the speed of light. Now use these values in the formula to estimate the number of seconds it takes for light to travel from the Sun to Earth.

time = 100,000,000 / 200,000
Hint 3:
time = 500

According to our estimate, it takes light approximately 500 seconds to travel from the Sun to Earth. Select C.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

25.) "2002_2_gr10_scaffold (2006/09/14 18:42:09)" (Problem ID: 12949) RADIO_BUTTON [MA - 2002 - Spring - 3]

No knowledge components have been assigned

Darlene went to the hardware store to purchase 581 feet of rope. The rope costs $0.61 per yard. Which is closest to the amount of money Darlene needs to purchase the rope?

Answers: (Interface Type: RADIO_BUTTON)

✗ 100.00
✓ **120.00**
✗ 360.00
✗ 1080.00

(Problem ID: 12950) RADIO_BUTTON [MA - 2002 - Spring - 3]

No knowledge components have been assigned

Since we have one measurement of the rope in feet and we need to have the measurement in yards to calculate the total price we must first convert the 581 feet into yards. What is the closest approximation to the number of yards in 581 feet?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 12951) RADIO_BUTTON [MA - 2002 - Spring - 3]

No knowledge components have been assigned

Approximately how much does 200 yards of rope cost to buy?

Answers: (Interface Type: RADIO_BUTTON)

26.) "2002_12R_gr10_scaffold (2006/09/25 20:47:43)" (Problem ID: 13297) RADIO_BUTTON [MA - 2002 - Fall - 12]

No knowledge components have been assigned

Victoria's automobile used approximately 5.8 gallons of gas to travel a total of 173 miles. Which of the following is closest to the number of miles per gallon Victoria's automobile averaged on this trip?

Answers: (Interface Type: RADIO_BUTTON)

✗ 3
✗ 20
✓ **30**
✗ 36

(Problem ID: 14494) RADIO_BUTTON [MA - 2002 - Fall - 12]

No knowledge components have been assigned

Let's first find out what operation we are supposed to use to determine the miles per gallon from the information that we have. Which of the following is the correct operation?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 14495) RADIO_BUTTON [MA - 2002 - Fall - 12]

No knowledge components have been assigned

Now back to the original question, if Victoria used 5.8 gallons of gas and traveled 173 miles how many miles per gallon did she get?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section

End Linear Section Begin Linear Section

Begin Random Order Section

27.) "pre_2002_6r_gr10" (Problem ID: 21274) RADIO_BUTTON [MA - 2002 - FALL - 6]

No knowledge components have been assigned

$$\frac{24 - (3 + 1) \cdot 4}{20 - 2^4}$$

Simplify the expression above.

Answers: (Interface Type: RADIO_BUTTON)

✗ $^7/_6$

✗ $^3/_4$

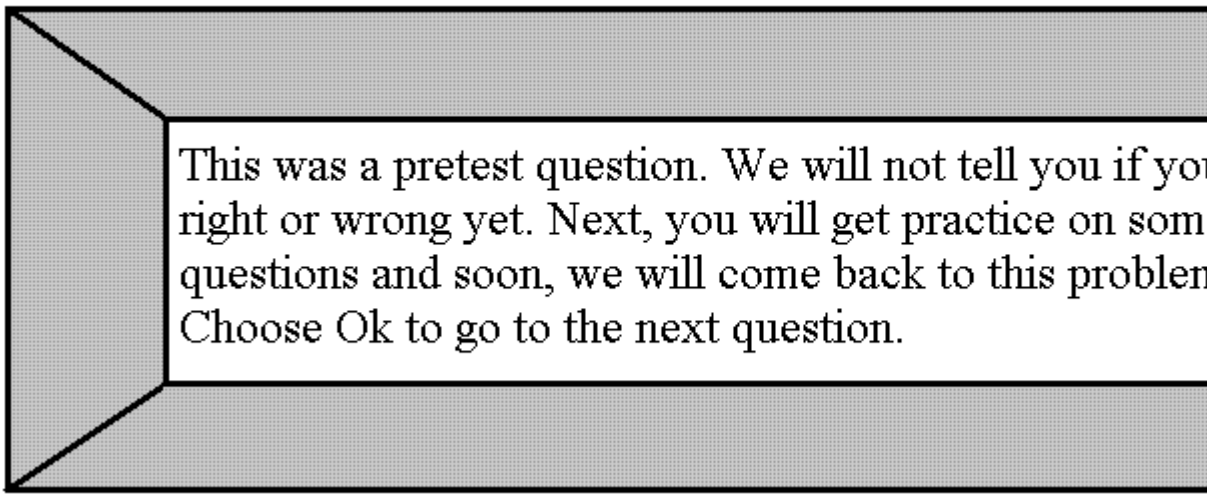
✓ **2**

✗ 20

(Problem ID: 21275) RADIO_BUTTON [MA - 2002 - FALL - 6]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

28.) "pre_2003_22_gr10" (Problem ID: 21278) RADIO_BUTTON [MA - 2003 - Spring - 22]

No knowledge components have been assigned

Water is flowing from a 1.5-inch nozzle with water pressure of 65 pounds per square inch. The rate (in gallons per minute) at which water flows from this nozzle is represented by the expression $29.7 * (1.5)^2\sqrt{(65)}$. What is the approximate rate at which the water flows in gallons per minute?

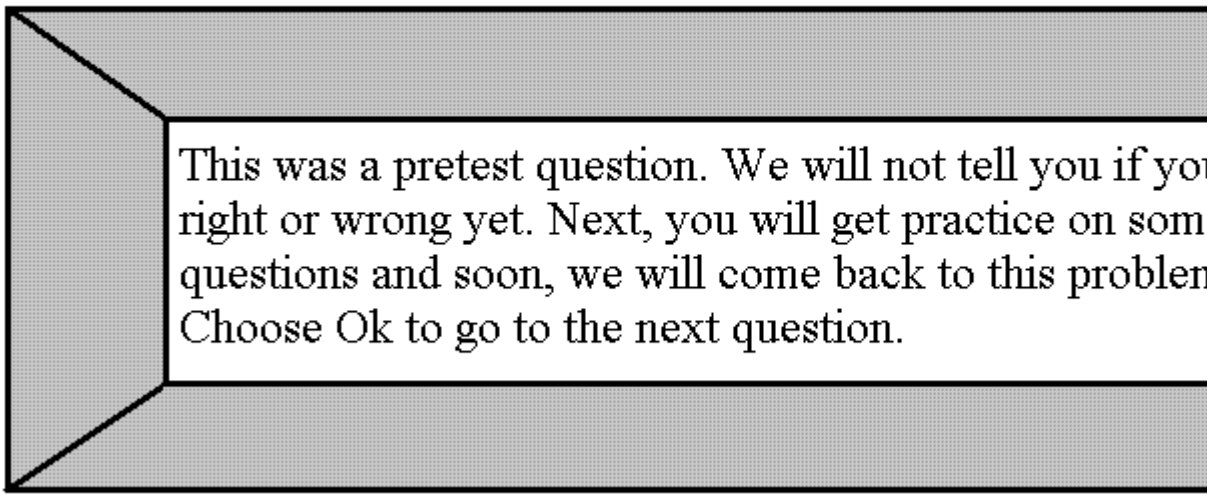
Answers: (Interface Type: RADIO_BUTTON)

✗ 239
✗ 293
✗ 359
✓ **539**

(Problem ID: 21279) RADIO_BUTTON [MA - 2003 - Spring - 22]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

29.) "2004_1_gr10 (2006/09/14 00:30:37)" (Problem ID: 12870) RADIO_BUTTON

No knowledge components have been assigned
What is the value of the expression below?

$6(5^2 - 5)$
Answers: (Interface Type: RADIO_BUTTON)
✗ 25
✓ **120**
✗ 30
✗ 145

(Problem ID: 12874) TEXT_FIELD

Remember that order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction. Therefore we need to solve for the expression inside of the parenthesis, what is this value?

(Problem ID: 12875) RADIO_BUTTON

Now that we evaluated the expression within the parenthesis we can perform the multiplication. What is the value of the expression $6(5^2 - 5)$?

30.) "2003retest_1_gr10 (2006/10/31 15:59:12)" (Problem ID: 14489) RADIO_BUTTON [MA - 2003 - NOV - 1]

No knowledge components have been assigned
Tanya wants to evaluate the expression below using the order of operations.

1 + 4 * 8 ÷ (4 - 2) + 6

Which of the following represent the correct value for this expression?
Answers: (Interface Type: RADIO_BUTTON)
✗ 21
✓ **23**
✗ 5
✗ 7

(Problem ID: 14490) RADIO_BUTTON [MA - 2003 - NOV - 1]
Remember that order of operations is parenthesis and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction. Which of the following has the first step of the order of operations completed correctly?

1 + 4 * 8 ? (4 - 2) + 6

(Problem ID: 14491) RADIO_BUTTON [MA - 2003 - NOV - 1]
Now that we have evaluated the parentheses, we want to evaluate the multiplication and division from left to right. Which expression has the next step correctly evaluated?
1 + 4 * 8 ? 2 + 6

(Problem ID: 14492) RADIO_BUTTON [MA - 2003 - NOV - 1]
Now we only have addition left. Calculate the value of the expression
1 + 16 + 6

31.) "2004_11_gr10 (2006/09/25 18:07:07)" (Problem ID: 13269) RADIO_BUTTON [MA - 2004 - NULL - 11]
No knowledge components have been assigned
What is the value of the expression below?

6(5 - 3) - 4(2 + 5 - (3 - 2))
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 4
✗ B. 8
✓ **C. -12**
✗ D. -15

(Problem ID: 13270) RADIO_BUTTON [MA - 2004 - NULL - 11]
In this problem we need to follow the order of operations. Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and left to right addition and subtraction. Follow the order of operations and solve the red and blue parts of the expression.

6(5 - 3) - 4(2 + 5 - (3 - 2))

(Problem ID: 13289) RADIO_BUTTON [MA - 2004 - NULL - 11]

Now that we have simplified the expression to 6 * 2 - 4(2 + 5 - 1). Following the order of operations the next step is to evaluate the expression in the parentheses. Which answer correctly simplifies the red part of the expression?
6 * 2 - 4(2 + 5 - 1)

(Problem ID: 13290) RADIO_BUTTON [MA - 2004 - NULL - 11]

The expression has been simplified down to 6 * 2 - 4 * 6. To solve the original problem of finding the value of the expression, we just need to solve this expression. What is the value of the expression 6 * 2 - 4 * 6?

32.) "1999_8_gr10 (2006/10/04 20:38:57)" (Problem ID: 13817) RADIO_BUTTON [MA - 1999 - SPRING - 8]

No knowledge components have been assigned

The expression $\left(\sqrt{16} + 2 \cdot 4^0\right)^3$ is equal to

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 64
✓ **B. 216**
✗ C. 512
✗ D. 1000

(Problem ID: 13822) RADIO_BUTTON [MA - 1999 - SPRING - 8]

$\left(\sqrt{16} + 2 \cdot 4^0\right)^3$

Remember that order of operations is parenthesis and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction. Let's start by trying to solve the blue part of the equation. What expression has the blue part of the expression correctly solved?

(Problem ID: 13823) RADIO_BUTTON [MA - 1999 - SPRING - 8]

We have now simplified the original expression $\left(\sqrt{16} + 2 \cdot 4^0\right)^3$, down to $(6)^3$. Which value is this expression equal to?

End Random Order Section Begin Random Order Section

33.) "2004_1_gr10_hint (2006/12/13 20:44:22)" (Problem ID: 15439) RADIO_BUTTON [MA - 2004 - Spring - 1]

No knowledge components have been assigned

What is the value of the expression below?

$6(5^2 - 5)$

Answers: (Interface Type: RADIO_BUTTON)
✗ A. 25
✗ B. 30
✓ **C. 120**
✗ D. 145

Hint 1:
Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction.
Hint 2:
Start by evaluating the expression inside the parentheses.
$6(5^2 - 5)$
Hint 3:
$6(25 - 5)$
$6(20)$
Now we just need to perform the multiplication
$6(20)$
Hint 4:
120
Select C.

34.) "2003retest_1_gr10_hint (2007/01/06 17:20:34)" (Problem ID: 15642) RADIO_BUTTON [MA - 2003 - NOV - 1]

No knowledge components have been assigned
Tanya wants to evaluate the expression below using the order of operations.

$1 + 4 * 8 / (4 - 2) + 6$

What of the following represent the correct value for this expression?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 5
✗ B. 7
✗ C. 21
✓ **D. 23**

Hint 1:
Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction.

Start by calculating the parentheses in blue.

$1 + 4 * 8 / (4 - 2) + 6$
Hint 2:
$1 + 4 * 8 / 2 + 6$

Now solve for the multiplication and division by evaluating the part of the expression in green.

$1 + 4 * 8 / 2 + 6$
Hint 3:

1 + 32 / 2 + 6
1 + 16 + 6

Now we can just solve for the addition.

1 + 16 + 6
Hint 4:
17 + 6
23

Select D.

35.) "2004_11_gr10_hint (2007/01/02 20:45:32)" (Problem ID: 15569) RADIO_BUTTON [PA - 2005 - SPRING - 1C]

No knowledge components have been assigned
What is the value of the expression below?

6(5 - 3) - 4(2 + 5 - (3 - 2))
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 4
✗ B. 8
✓ **C. -12**
✗ D. -15

Hint 1:
Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and left to right addition and subtraction.
Hint 2:
Begin by working on the parentheses. 6(5 - 3) - 4(2 + 5 - (3 - 2))
6(5 - 3) - 4(2 + 5 - 1)
6 * 2 - 4(2 + 5 - 1)
6 * 2 - 4(7 - 1)
6 * 2 - 4 * 6
Hint 3:
Now perform the multiplication before the subtraction.
6 * 2 - 4 * 6
12 - 4 * 6
12 - 24
-12
Select C.

36.) "1999_8_gr10_hint (2007/01/06 16:44:23)" (Problem ID: 15641) RADIO_BUTTON [MA - 1999 - NOV - 8]

No knowledge components have been assigned

$\left(\sqrt{16} + 2 \cdot 4^0\right)^3$

The expression above is equal to
Answers: (Interface Type: RADIO_BUTTON)
✗ A. 64

✗ B. 216
✓ **C. 512**
✗ D. 1000

Hint 1:

$\left(\sqrt{16} + 2 \cdot 4^0\right)^3$

Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction.

Start by trying to solve the blue part of the equation.

Hint 2:

$\left(\sqrt{16} + 2 \cdot 4^0\right)^3$

$\left(4 + 2 \cdot 4^0\right)^3$

Once the square root has been solved we need to evaluate the inner exponent before doing multiplication or addition.

Hint 3:

$\left(\sqrt{16} + 2 \cdot 4^0\right)^3$

$\left(4 + 2 \cdot 4^0\right)^3$

$\left(4 + 2 \cdot 1\right)^3$

Remember that any number raised to a power of zero is always equal to 1. Now continue to solve for the blue part of the equation by performing the multiplication then addition.

Hint 4:

$\left(\sqrt{16} + 2 \cdot 4^0\right)^3$

$\left(4 + 2 \cdot 4^0\right)^3$

$\left(4 + 2 \cdot 1\right)^3$

$\left(4 + 2\right)^3$

$\left(6\right)^3$

Now that the expression inside the parentheses has been evaluated, evaluate the outer exponent.

Hint 5:

$6^3 = 512$. Select C.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

37.) "2002_6R_gr10_scaffold (2006/11/02 10:08:19)" (Problem ID: 14549) RADIO_BUTTON [MA - 2002 - FALL - 6]

No knowledge components have been assigned

$$\frac{24 - (3 + 1) \cdot 4}{20 - 2^4}$$

Simplify the expression above.
Answers: (Interface Type: RADIO_BUTTON)
✗ $^7/_6$
✗ $^3/_4$
✓ **2**
✗ 20

(Problem ID: 14550) TEXT_FIELD [MA - 2002 - FALL - 6]

No knowledge components have been assigned
Remember that order of operations is parenthesis and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction. What is the numerator once it is simplified?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 14551) TEXT_FIELD [MA - 2002 - FALL - 6]

No knowledge components have been assigned
What is the denominator once it is simplified in the same fashion?
Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 14552) RADIO_BUTTON [MA - 2002 - FALL - 6]

No knowledge components have been assigned
Now we have the simplified numerator and denominator. What is the simplified version of the original expression?
Answers: (Interface Type: RADIO_BUTTON)

38.) "2002_19R_gr10_scaffold (2006/09/25 22:02:26)" (Problem ID: 13302) TEXT_FIELD [MA - 2002 - Fall - 19]

No knowledge components have been assigned
When 100 is divided by a number n, the quotient is 14 with a remainder of 2. What is the value of n?
Answers: (Interface Type: TEXT_FIELD)
✓ **7**

(Problem ID: 13303) RADIO_BUTTON [MA - 2002 - Fall - 19]

No knowledge components have been assigned
Let's make an equation to figure this out. We know that one of the sides of the equation will be 100. Then we know that we have a remainder of 2 and a quotient of 14. What would this equation look like?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13304) TEXT_FIELD [MA - 2002 - Fall - 19]

No knowledge components have been assigned

Now we can solve for n to figure out the answer. What is the number we divided into 100?

Answers: (Interface Type: TEXT_FIELD)

39.) "2003_22_gr10_scaffold (2006/09/14 17:35:20)" (Problem ID: 12947) RADIO_BUTTON [MA - 2003 - Spring - 22]

No knowledge components have been assigned

Water is flowing from a 1.5-inch nozzle with water pressure of 65 pounds per square inch. The rate (in gallons per minute) at which water flows from this nozzle is represented by the expression 29.7 * $(1.5)^2\sqrt{}(65)$. What is the approximate rate at which the water flows in gallons per minute?

Answers: (Interface Type: RADIO_BUTTON)

✗ 239
✗ 293
✗ 359
✓ **539**

(Problem ID: 12948) RADIO_BUTTON [MA - 2003 - Spring - 22]

No knowledge components have been assigned

We find that the rate at which the water flows out of the nozzle is represented by 29.7 * $(1.5)^2\sqrt{}(65)$. This is what the question was asking, so what is this equation simplified?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section
End Linear Section Begin Linear Section
Begin Random Order Section

40.) "pre_2005-21" (Problem ID: 21300) TEXT_FIELD [MA - 2005 - Spring - 21]

No knowledge components have been assigned

What is the value of the following expression?

|-5| + |-5| - |-3|

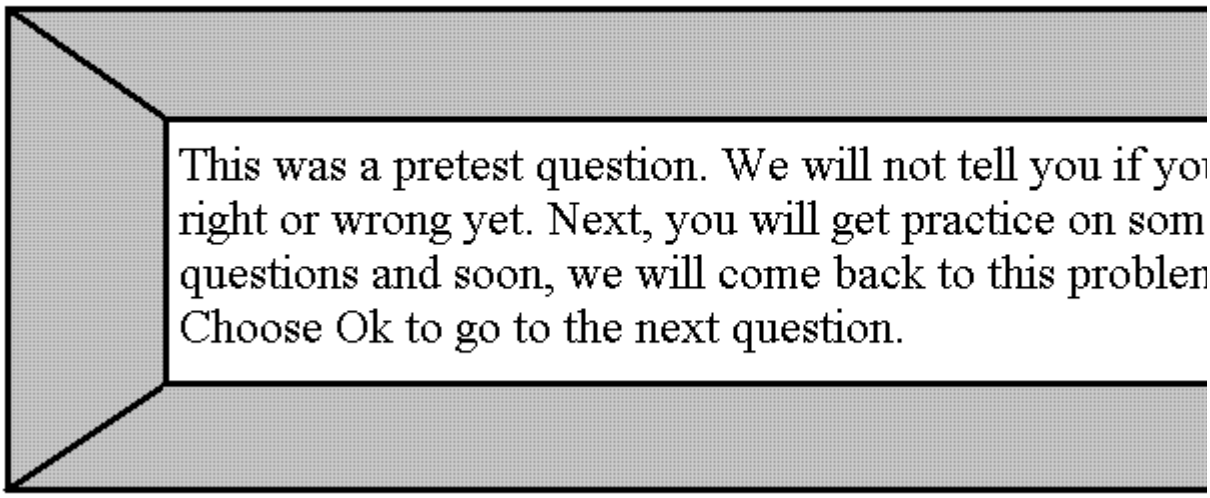
Answers: (Interface Type: TEXT_FIELD)

✓ **7**

(Problem ID: 21301) RADIO_BUTTON [MA - 2005 - Spring - 21]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

41.) "pre_2006_13_gr8" (Problem ID: 21304) RADIO_BUTTON [MA - 2006 - SPRING - 13]

No knowledge components have been assigned

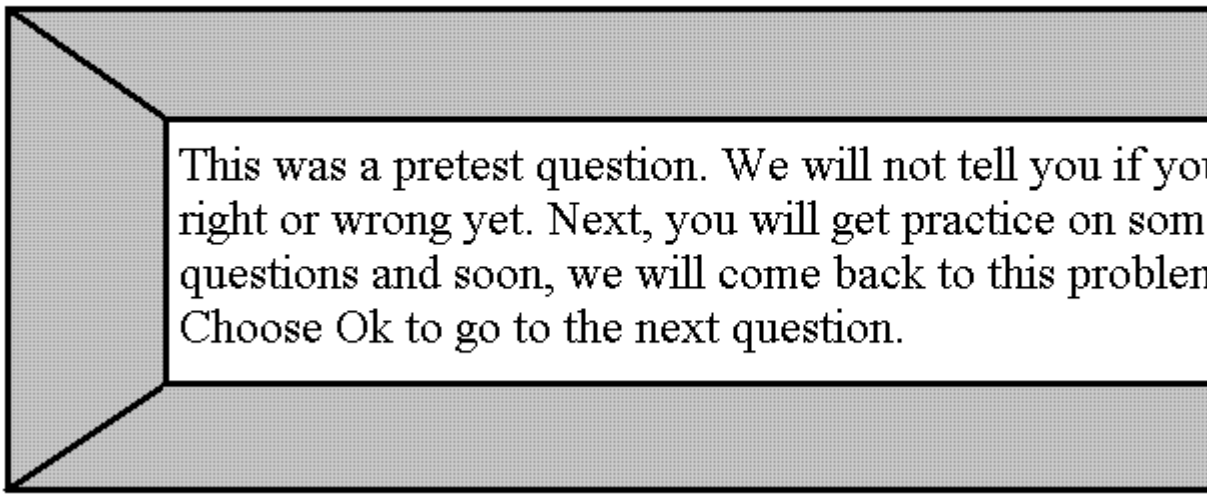
Which of the following expressions is **not** equivalent to -7?
Answers: (Interface Type: RADIO_BUTTON)

✗ A. (-4 - 3)
✗ B. -(4 + 3)
✓ **C. |-4 - 3|**
✗ D. -|4 + 3|

(Problem ID: 21305) RADIO_BUTTON [MA - 2006 - SPRING - 13]

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this question later. Please click Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

42.) "2004retest_8_gr10 (2006/09/28 01:08:39)" (Problem ID: 13594) RADIO_BUTTON

No knowledge components have been assigned

What is the value of the expression below?
| 3 - 5 * 2 | - 4
Answers: (Interface Type: RADIO_BUTTON)
✗ -11
✗ 0
✗ -8
✓ **3**

(Problem ID: 13595) TEXT_FIELD

In this problem we need to follow the order of operations. Remember that THE order of operations is parentheses, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction. Let's start by evaluating the expression within the absolute value. What is the value of the blue part |3 - 5 * 2| - 4?

(Problem ID: 13597) RADIO_BUTTON

We have now simplified the expression to |-7| - 4. Continue to use the order of operations to simplify the expression. What is the value of |-7| - 4?

43.) "2004_6_gr10 (2006/09/14 00:56:11)" (Problem ID: 12876) RADIO_BUTTON

No knowledge components have been assigned

What is the value of the expression below?

-3|6 - 10| + 4
Answers: (Interface Type: RADIO_BUTTON)
✗ 12
✗ 16
✗ -16
✓ **-8**

(Problem ID: 12877) TEXT_FIELD
Remember that order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction. We begin solving the problem by calculating the value of |6 - 10|. What is this expression equal to?

(Problem ID: 12878) RADIO_BUTTON
Now that we have solved for the absolutely value, we can continue on with the rest of the expression. What is the value of the expression, -3(4) + 4?

End Random Order Section Begin Random Order Section

44.) "2004retest_2_gr10_hint (2007/01/06 12:57:41)" (Problem ID: 15635) RADIO_BUTTON [MA - 2004 - NOV - 2]

No knowledge components have been assigned
What is the value of the expression below?

| 3 - 5 * 2 | - 4
Answers: (Interface Type: RADIO_BUTTON)
✗ A. -11
✗ B. -8
✗ C. 0
✓ **D. 3**

Hint 1:
In this problem we need to follow the order of operations. Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication and division, and finally from left to right addition and subtraction.

Let's start by evaluating the expression within the absolute value. Evaluate the part in blue.
|3 - 5 * 2| - 4
Hint 2:
|3 - 5 * 2| - 4

The multiplication has to be performed before the subtraction because of the order of operations.

|3 - **5 * 2**| - 4
|3 - **10**| - 4
|-7| - 4

Next evaluate the absolute value.
Hint 3:
The absolute value removes the negative, if there is one, from a number.

|-7| - 4
7 - 4
Hint 4:
3

After the final subtraction we get 3. Select D.

45.) "2004_6_gr10_hint (2006/12/13 22:15:43)" (Problem ID: 15440) RADIO_BUTTON [MA - 2004 - SPRING - 6]

No knowledge components have been assigned
What is the value of the expression below?

-3|6 - 10| + 4
Answers: (Interface Type: RADIO_BUTTON)
✗ A. -16
✓ **B. -8**
✗ C. 12
✗ D. 16
Hint 1:
Remember that the order of operations is parentheses and absolute value, then exponents and roots, then from left to right multiplication, and finally from left to right addition and subtraction.
Hint 2:
Start by evaluating the absolute value.
-3|6 - 10| + 4
Hint 3:
-3|-4| + 4
-3(4) + 4
Now perform the multiplication.
-3(4) + 4
Hint 4:
-12 + 4
Now perform the addition.
-12 + 4
Hint 5:
-8
Select B.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

46.) "2005-21" (Problem ID: 8857) TEXT_FIELD [MA - 2005 - Spring - 21]

No knowledge components have been assigned
What is the value of the following expression?

|-5| + |-5| - |-3|
Answers: (Interface Type: TEXT_FIELD)
✓ **7**

(Problem ID: 8858) ALGEBRA_FIELD [MA - 2005 - Spring - 21]
No knowledge components have been assigned
|-5| =
Answers: (Interface Type: ALGEBRA_FIELD)

(Problem ID: 8859) RADIO_BUTTON [MA - 2005 - Spring - 21]
No knowledge components have been assigned
Which of the following is an equivalent expression to the one you're trying to solve?
Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 8860) TEXT_FIELD [MA - 2005 - Spring - 21]
No knowledge components have been assigned
What is the value of the following expression?

|-5| + |-5| - |-3|
Answers: (Interface Type: TEXT_FIELD)

47.) "2006_13_gr8" (Problem ID: 14818) RADIO_BUTTON [MA - 2006 - SPRING - 13]

Knowledge components:

Transfermodel	Knowledge Component
106-KC Transfer Model Created by WPI for 8th Grade Math	Integers

Which of the following expressions is **not** equivalent to -7?
Answers: (Interface Type: RADIO_BUTTON)
✗ A. (-4 - 3)
✗ B. -(4 + 3)
✓ **C. |-4 - 3|**
✗ D. -|4 + 3|

Hint 1:
The absolute value of x, denoted "| x |" (and which is read as "the absolute value of x"), is regarded as the distance of x from zero. This is why absolute value is never negative; absolute value only asks "how far?", not "in which direction?". This means that | 3 | = 3, because 3 is three units to the right of zero, and also | –3 | = 3, because –3 is three units to the left of zero.
Hint 2:
That means |-4 - 3| is equal to 7, not -7, so this is the answer.
Hint 3:
Choose C.

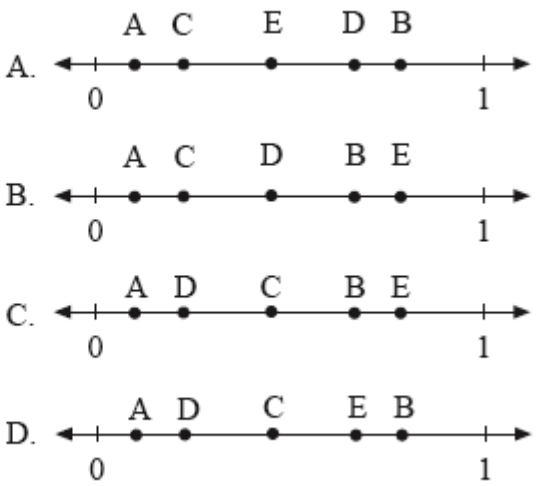
End Random Order Section

End Linear Section Begin Linear Section
Begin Random Order Section

48.) "pre_2001_29r_gr10" (Problem ID: 21463) RADIO_BUTTON [MA - 2001 - FALL - 29]

No knowledge components have been assigned

Point	Location on the Number Line
A	0.13
B	$\frac{5}{8}$
C	$\frac{\sqrt{3}}{4}$
D	25×10^{-2}
E	$\frac{\pi}{4}$



Based on the the data in the table above, which of the above number lines **best** represents the correct location of all five points?

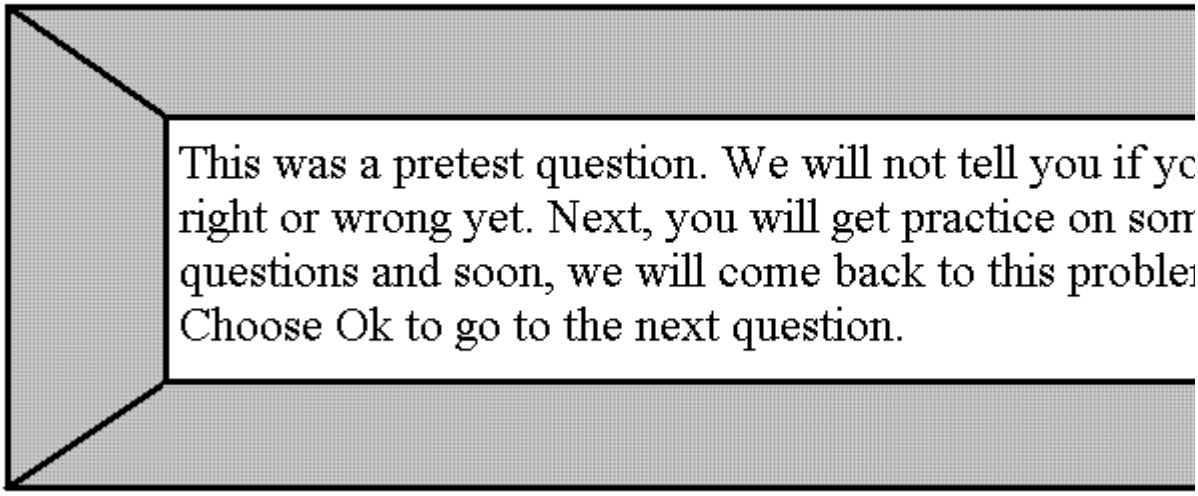
Answers: (Interface Type: RADIO_BUTTON)

✗ A
✗ B
✓ C
✗ D

(Problem ID: 21464) RADIO_BUTTON [MA - 2001 - FALL - 29]

No knowledge components have been assigned

Pretest Question



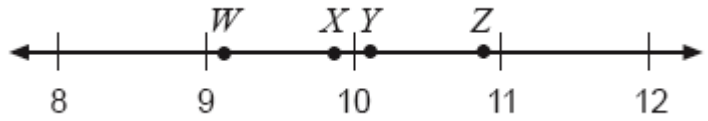
Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Please choose Ok to continue.

Answers: (Interface Type: RADIO_BUTTON)

49.) "pre_2002_2r_gr10" (Problem ID: 21466) RADIO_BUTTON [MA - 2002 - FALL - 2]

No knowledge components have been assigned



Which of the following points on the number line is closest to $\sqrt{94}$?

Answers: (Interface Type: RADIO_BUTTON)

✗ W
✓ **X**
✗ Y
✗ Z

(Problem ID: 21467) RADIO_BUTTON [MA - 2002 - FALL - 2]

No knowledge components have been assigned

Pretest Question

This was a pretest question. We will not tell you if yo
right or wrong yet. Next, you will get practice on som
questions and soon, we will come back to this problen
Choose Ok to go to the next question.

Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

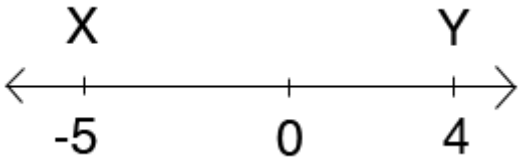
We will come back to this problem later. Please choose Ok to continue.

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

50.) "2003retest_2_gr10 (2006/11/02 06:23:12)" (Problem ID: 14547) RADIO_BUTTON [MA - 2003 - NOV - 2]

No knowledge components have been assigned



The number line above shows points X and Y with coordinates -5 and 4 respectively.

Which of the following expressions represents the distance from point X to point Y?
Answers: (Interface Type: RADIO_BUTTON)
✗ $(4 - (-5))^2$
✗ $|4 - 5|$
✗ $(4 - 5)^2$
✓ **$|4 - (-5)|$**

(Problem ID: 14548) RADIO_BUTTON [MA - 2003 - NOV - 2]

Let's try a similar problem that is easier but still gets across the same idea. What is the distance between the points A and B on the number line above?

(Problem ID: 14616) RADIO_BUTTON [MA - 2003 - NOV - 2]
The important thing to remember is to use the technique from the last problem with the original problem. Remember that to find the distance between two points, you need to subtract their positions and take the absolute value because distance should always be positive. What is the distance between points X and Y on the number line above?

51.) "2004retest_14_gr10 (2006/09/28 01:33:55)" (Problem ID: 13614) RADIO_BUTTON

No knowledge components have been assigned
Between which of the following two integers does $3\sqrt{}(10)$ lie on the number line?
Answers: (Interface Type: RADIO_BUTTON)
✗ 6 and 7
✗ 7 and 8
✗ 8 and 9
✓ **9 and 10**

(Problem ID: 13616) RADIO_BUTTON
Let's start by estimating the value of $\sqrt{}(10)$, which of the following is the closest estimate?

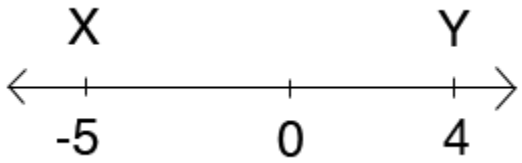
(Problem ID: 13618) RADIO_BUTTON
Since we estimated the value of $\sqrt{}(10)$ as 3, we can now estimate the value of $3\sqrt{}(10)$ and

select which range the value is in. Remember that $\sqrt{}10$ is larger than 3 because 10 is larger than 9. Between what numbers on the number line does $3\sqrt{}(10)$ fall?

End Random Order Section Begin Random Order Section

52.) "2003retest_2_gr10 (2006/11/02 06:23:12)" (Problem ID: 20940) RADIO_BUTTON

No knowledge components have been assigned



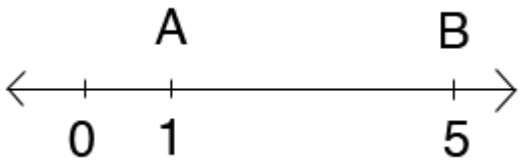
The number line above shows points X and Y with coordinates -5 and 4 respectively.

Which of the following expressions represents the distance from point X to point Y?

Answers: (Interface Type: RADIO_BUTTON)

✗ $(4 - (-5))^2$
✗ $|4 - 5|$
✗ $(4 - 5)^2$
✓ **$|4 - (-5)|$**

(Problem ID: 20941) RADIO_BUTTON



Let's try a similar problem that is easier but still gets across the same idea. What is the distance between the points A and B on the number line above?

(Problem ID: 20942) RADIO_BUTTON

The important thing to remember is to use the technique from the last problem with the original problem. Remember that to find the distance between two points, you need to subtract their positions and take the absolute value because distance should always be positive. What is the distance between points X and Y on the number line above?

53.) "2004retest_14_gr10_hint (2007/01/06 13:18:17)" (Problem ID: 15637) RADIO_BUTTON [MA - 2004 - NOV - 14]

No knowledge components have been assigned

Between which of the following two integers does $3\sqrt{}(10)$ lie on the number line?

Answers: (Interface Type: RADIO_BUTTON)

✗ A. 6 and 7
✗ B. 7 and 8
✗ C. 8 and 9

✓ **D. 9 and 10**

Hint 1:
To find out where $3\sqrt{(10)}$ falls on the number line, we need to find an estimate for the expression. Let's start by estimate the value of $\sqrt{(10)}$.
Hint 2:
We can estimate the value of $\sqrt{(10)}$ by using 9 instead of 10. Since 9 is a perfect square it will make the calculation easier.

$3\sqrt{9}$

Find the value of $\sqrt{9}$.
Hint 3:
$3\sqrt{9}$
3(3)

Now we can get an estimate for the expression and find where it is in the number line.
Hint 4:
3(3) = 9

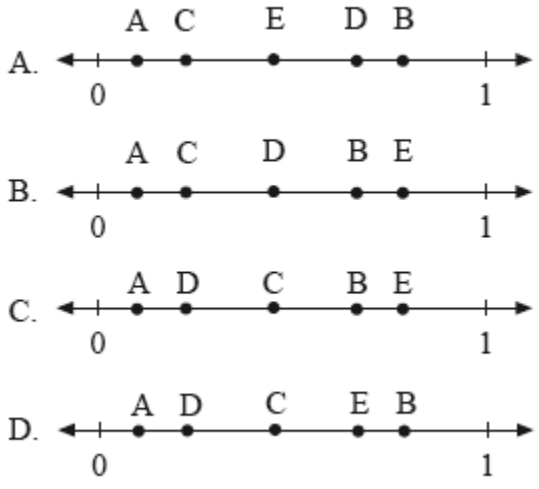
This does not tell us which answer is correct. We need to remember that we used 9 as an estimate for 10 earlier. This means that our estimate of the entire expression is lower than the actual value. The answer must be greater than 9 and that means the correct answer has to be between 9 and 10. Select D.

End Random Order Section
End '{Problem}' Section Begin Random Order Section

54.) "2001_29R_gr10_scaffold (2006/09/27 21:58:18)" (Problem ID: 13505) RADIO_BUTTON [MA - 2001 - FALL - 29]

No knowledge components have been assigned

Point	Location on the Number Line
A	0.13
B	$\frac{5}{8}$
C	$\frac{\sqrt{3}}{4}$
D	25×10^{-2}
E	$\frac{\pi}{4}$



Based on the the data in the table above, which of the above number lines **best** represents the correct location of all five points?
Answers: (Interface Type: RADIO_BUTTON)
✗ A

✗ B
✓ **C**
✗ D

(Problem ID: 13518) RADIO_BUTTON [MA - 2001 - FALL - 29]

No knowledge components have been assigned

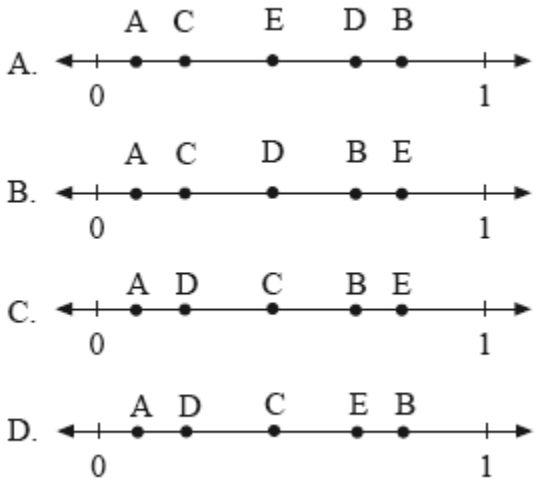
First we should take all the numbers and create decimals out of them so that it is easy to see which of them is the largest and so forth. Which of the following answers give each point as a close decimal representation?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 13526) RADIO_BUTTON [MA - 2001 - FALL - 29]

No knowledge components have been assigned

Point	Location on the Number Line
A	0.13
B	$\frac{5}{8}$
C	$\frac{\sqrt{3}}{4}$
D	25×10^{-2}
E	$\frac{\pi}{4}$

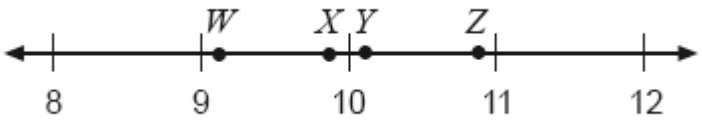


Now we can list them in numerical order. Which is the order from smallest to largest?

Answers: (Interface Type: RADIO_BUTTON)

55.) "2002_2R_gr10_scaffold (2006/09/24 13:54:56)" (Problem ID: 13230) RADIO_BUTTON [MA - 2002 - FALL - 2]

No knowledge components have been assigned



Which of the following points on the number line is closest to $\sqrt{94}$?

Answers: (Interface Type: RADIO_BUTTON)

✗ W
✓ **X**
✗ Y
✗ Z

(Problem ID: 13231) TEXT_FIELD [MA - 2002 - FALL - 2]

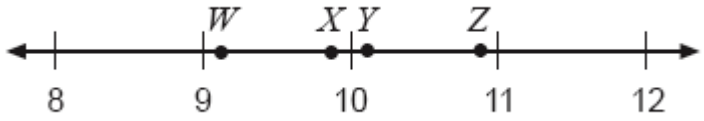
No knowledge components have been assigned

Let's start by finding a close perfect square that is near to 94. This will allow us to make an estimate of the position of $\sqrt{\ }94$. What is the closest perfect square to 94?

Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 13232) RADIO_BUTTON [MA - 2002 - FALL - 2]

No knowledge components have been assigned



What is the closest point to $\sqrt{\ }94$?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section

End Linear Section Begin Linear Section

Begin Random Order Section

56.) "pre_item5_2001_gr8" (Problem ID: 21469) RADIO_BUTTON

No knowledge components have been assigned

A hole in a piece of metal has a diameter of $3\ ^{1}/_{2}$ inches. Which of the following pipes is the **largest** that will fit through the hole?

Answers: (Interface Type: RADIO_BUTTON)

✗ a pipe with a diameter of $3\ ^{5}/_{16}$ inches

✗ a pipe with a diameter of $3\ ^{3}/_{8}$ inches

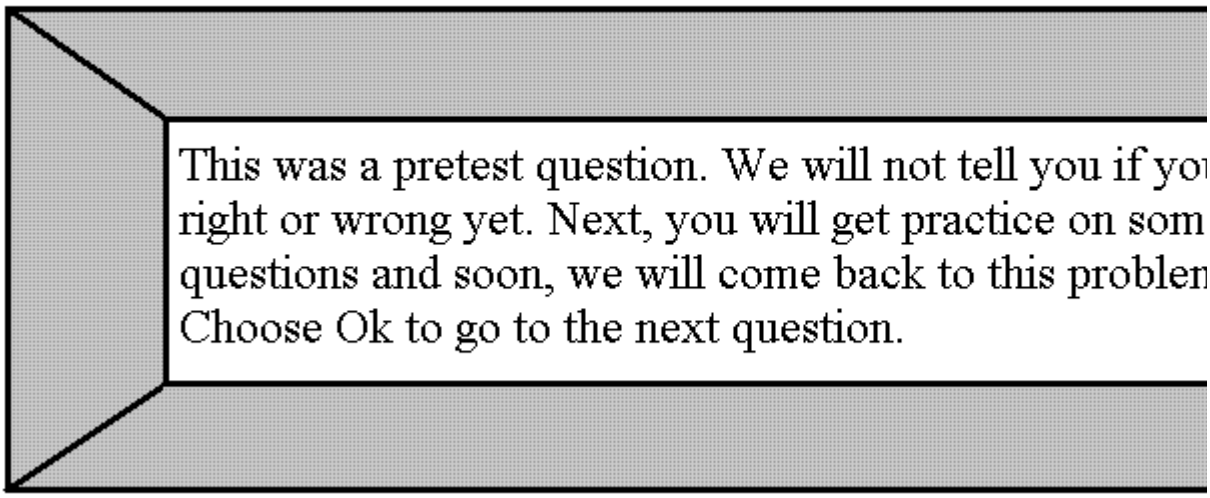
✗ a pipe with a diameter of $3\ ^{7}/_{8}$ inches

✓ **a pipe with a diameter of $3\ ^{7}/_{16}$ inches**

(Problem ID: 21472) RADIO_BUTTON

No knowledge components have been assigned

Pretest Question



Because this was a pretest question, please disregard the comment "Hmm, no. Let me break this down for you."

We will come back to this problem later. Please choose Ok to continue.
Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section Begin '{ChooseOne}' Section
Begin Random Order Section

57.) "1999_2_gr10 (2006/10/04 19:04:36)" (Problem ID: 13809) RADIO_BUTTON

No knowledge components have been assigned

An auto mechanic tries a $\frac{5}{8}$ inch wrench to loosen a bolt. This wrench almost fits but it is slightly too small. Of the following wrench sizes given in inches, which is the next larger one?
Answers: (Interface Type: RADIO_BUTTON)

✗ A. $\frac{7}{8}$
✗ B. $\frac{9}{16}$
✗ C. $\frac{3}{4}$
✓ **D.** $\frac{11}{16}$

(Problem ID: 13811) RADIO_BUTTON

Before we can solve this problem we need to find a common denominator for the fractions so that we can directly compare them. What would be the least common denominator for the given denominators shown in blue?
5/8 7/8 9/16 3/4 11/16

(Problem ID: 14620) RADIO_BUTTON

In this problem we need to find which of the fractions is next higher than $\frac{5}{8}$ but the answers are all fractions with different denominators. Try converting all the answers to use to common denominator of 16 we found in the last question. Of the following wrench sizes given in inches, which is the next larger?

End Random Order Section Begin Random Order Section

58.) "1999_2_gr10_hint (2006/12/07 01:54:47)" (Problem ID: 15277) RADIO_BUTTON [MA - 1999 - SPRING - 2]

No knowledge components have been assigned

A. $\frac{7}{8}$

B. $\frac{9}{16}$

C. $\frac{3}{4}$

D. $\frac{11}{16}$

An auto mechanic tries a $^5/_8$ inch wrench to loosen a bolt. This wrench almost fits but it is slightly too small. Of the wrench sizes given above in inches, which is the next larger one?

Answers: (Interface Type: RADIO_BUTTON)

✗ A.
✗ B.
✗ C.
✓ **D.**

Hint 1:

$\frac{5}{8}$ $\frac{7}{8}$ $\frac{9}{16}$ $\frac{3}{4}$ $\frac{11}{16}$

Before we can solve this problem we need to find a common denominator for the fractions so that we can directly compare them. Find the least common denominator for the fractions by comparing the denominators in blue.

Hint 2:

The least common denominator must be at least as large as the largest denominator in the set. This means it cannot be smaller than 16.

Hint 3:

Check to see if the other denominators can be multiplied by a number to get 16.

Hint 4:

For each of the denominators they can be multiplied by a number to get 16.

16 * 1 = 16
8 * 2 = 16
4 * 4 = 16

Now convert all of the fractions so that they have a denominator of 16.

Hint 5:

$\frac{5}{8}=\frac{10}{16}$

$\frac{7}{8}=\frac{14}{16}$

$\frac{9}{16}=\frac{9}{16}$

$\frac{3}{4}=\frac{12}{16}$

$\frac{11}{16}=\frac{11}{16}$

After converting to a denominator of 16 we get the fractions above.

Hint 6:

Now just look for the next higher fraction above $^{5}/_{8}$ or $^{10}/_{16}$.

Hint 7:

$^{11}/_{16}$ is the next higher fraction. This means that the auto mechanic should use this wrench to loosen the bolt. Select D.

End Random Order Section

End '{Problem}' Section Begin Random Order Section

59.) "Item5-2001" (Problem ID: 231) RADIO_BUTTON [MA - 2001 - Spring - 5]

No knowledge components have been assigned

A hole in a piece of metal has a diameter of 3 $^{1}/_{2}$ inches. Which of the following pipes is the **largest** that will fit through the hole?

Answers: (Interface Type: RADIO_BUTTON)

✗ a pipe with a diameter of 3 $^{5}/_{16}$ inches

✗ a pipe with a diameter of 3 $^{3}/_{8}$ inches

✗ a pipe with a diameter of 3 $^{7}/_{8}$ inches

✓ **a pipe with a diameter of 3 $^{7}/_{16}$ inches**

(Problem ID: 224) TEXT_FIELD [MA - 2001 - Spring - 5]

No knowledge components have been assigned

It will be easier to compare the sizes if you convert the fractions to have the same denominator.

There are halves, eigths and sixteenths in the problem. What is the lowest common denominator?

Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 225) TEXT_FIELD [MA - 2001 - Spring - 5]

No knowledge components have been assigned

Right. There are 2 fractions that are already in 16ths. Let's convert the others. The size of the hole is 3 $^{1}/_{2}$ inches. We need to convert $^{1}/_{2}$ to 16ths. What is the converted fraction in 16ths?

Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 226) TEXT_FIELD [MA - 2001 - Spring - 5]

No knowledge components have been assigned

Good. $^{1}/_{2}$ converts to $^{8}/_{16}$. The next fraction to convert is $^{3}/_{8}$. What is $^{3}/_{8}$ in 16ths?

Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 227) TEXT_FIELD [MA - 2001 - Spring - 5]

No knowledge components have been assigned

Good. $^{3}/_{8}$ converts to $^{6}/_{16}$. The next fraction to convert is $^{7}/_{8}$. What is $^{7}/_{8}$ in 16ths?

Answers: (Interface Type: TEXT_FIELD)

(Problem ID: 228) RADIO_BUTTON [MA - 2001 - Spring - 5]

No knowledge components have been assigned

Correct. The fractions you need to compare are $^{8}/_{16}$, $^{6}/_{16}$, $^{14}/_{16}$, $^{5}/_{16}$, and $^{7}/_{16}$.

What can you say about the diameter of the pipe?

Answers: (Interface Type: RADIO_BUTTON)

(Problem ID: 230) RADIO_BUTTON [MA - 2001 - Spring - 5]

No knowledge components have been assigned

Good. That means you can eliminate any choices that are greater than or equal to $3\ ^{8}/_{16}$.

Which pipe has the **largest** diameter that will fit?

Answers: (Interface Type: RADIO_BUTTON)

End Random Order Section

End Linear Section

nd Linear Section

Appendix E - Data For the Study Curriculums

Category: Geometry
Experiment: 1
School: Shrewsbury
Sample: School-wide Results as of April 25th, 2007

Pre-Tes	Scaffolding		Hints		Post-Te	Gain Scores
# 21700	# 13688	# 13139	# 15479	# 15482	# 14099	gain1
0	0	0			1	1
0	0	0			0	0
0	0	1			1	1
0	0	1			1	1
0	0	1			1	1
0	0	1			0	0
1	0	1			1	0
1	0	0			1	0
0	1	0			0	0
0	1	0			0	0
0	1	0			0	0
0	1	0			0	0
0	1	0			1	1
0	1	0			1	1
0	1	0			0	0
0			1	0	0	0
0			0	1	0	0
0			0	1	1	1
0			1	1	0	0
0			0	0	1	1
0			0	0	0	0
0			1	0	1	1
0			0	0	1	1
0			1	0	1	1
0			1	0	0	0
0			0	1	0	0
1			0	0	1	0
1			0	1	1	0
1			0	1	1	0
1			0	0	1	0

Category: Geometry
Experiment: 2
School: Shrewsbury
Sample: School-wide Results as of April 25th, 2007

Pre-Tes	Scaffolding		Hints		Post-Te	Gain Scores
# 21661	# 13685	# 13617	# 15485	# 15489	# 14084	gain1
0	0	1			1	1
0	0	1			0	0
0	0	1			0	0
0	0	0			1	1
0	0	1			1	1
0	0	1			1	1
1	0	1			1	0
0	1	0			0	0

0	1	0			0	0
0	1	0			0	0
1	1	0			1	0
0			0	1	0	0
0			0	1	1	1
0			0	0	0	0
0			0	1	0	0
0			0	0	0	0
0			0	0	0	0
0			1	0	0	0
0			0	1	1	1
1			1	0	1	0
1			1	0	1	0

Category: Geometry
Experiment: 4
School: Shrewsbury
Sample: School-wide Results as of April 25th, 2007

Pre-Test		**Scaffolding**			**Hints**			**Post-Test**		**Gain Scores**		
# 21665	# 21780	# 13644	# 13676	# 12478	# 15500	# 15504	# 15432	# 14102	# 14857	gain1	gain2	SUM
0	0	0	0	0				1	1	1	1	2
0	0	1	0	0				1	1	1	1	2
1	0	0	0	1				1	1	0	1	1
0	0	0	1	1				0	1	0	1	1
0	0	0	1	1				1	0	1	0	1
0	1	0	1	1				1	1	1	0	1
0	0	1	1	0				1	1	1	1	2
0	0	1	1	0				1	0	1	0	1
0	0				0	1	1	0	0	0	0	0
0	0				1	1	0	1	0	1	0	1
1	1				1	0	1	1	1	0	0	0

Category: Geometry
Experiment: 5
School: Shrewsbury
Sample: School-wide Results as of April 25th, 2007

Pre-Test		**Scaffolding**		**Hints**		**Post-Test**		**Gain Scores**		
# 21761	# 21744	# 14861	# 13853	# 15425	# 15429	# 13851	# 12800	gain1	gain2	gain sum
0	0	0	1			1	0	1	0	1
0	0	0	1			1	0	1	0	1
0	0	0	0			0	0	0	0	0
0	0			1	0	0	1	0	1	1
0	0			1	0	1	1	1	1	2
0	0			0	0	1	1	1	1	2

Category: Algebra

Experiment: 1

School: North High

Sample: School-wide Results as of April 25th, 2007

Pre-Test		**Pretest**	**Scaffolding**			**Hints**			**Post-Test**			**Gain Scores**		
#15672	# 15676	**Sum**	# 14512	# 13894	# 13795	# 15329	# 15396	# 15450	# 14436	# 12937	**Conditi**	Gain1	Gain2	GainSun
0	1	1	0	0	0				0	0	s	0	-1	-1
1	0	1	0	0	0				0	0	s	-1	0	-1
1	0	1	0	0	1				0	0	s	-1	0	-1
0	0	0	0	0	0				0	0	s	0	0	0
0	0	0	0	0	0				0	0	s	0	0	0
0	0	0	0	0	0				0	0	s	0	0	0
0	0	0	0	0	0				0	0	s	0	0	0
0	0	0	0	0	0				0	0	s	0	0	0
0	0	0	0	1	0				0	0	s	0	0	0
0	0	0	0	1	0				0	0	s	0	0	0
0	0	0	0	1	0				0	0	s	0	0	0
0	0	0	0	1	0				0	0	s	0	0	0
1	0	1	0	0	0				1	0	s	0	0	0
1	0	1	0	0	0				1	0	s	0	0	0
1	0	1	0	0	0				1	0	s	0	0	0
1	0	1	0	0	0				1	0	s	0	0	0
1	0	1	0	0	0				1	0	s	0	0	0
1	0	1	0	1	0				1	0	s	0	0	0
1	1	2	0	0	0				1	1	s	0	0	0
1	1	2	0	0	1				1	1	s	0	0	0
1	1	2	0	1	0				1	1	s	0	0	0
1	1	2	0	1	0				1	1	s	0	0	0
0	0	0	1	1	0				0	0	s	0	0	0
0	0	0	1	1	0				0	0	s	0	0	0
0	0	0	1	1	0				0	0	s	0	0	0
0	0	0	1	1	0				0	0	s	0	0	0
1	0	1	1	0	0				1	0	s	0	0	0
1	0	1	1	0	1				1	0	s	0	0	0
1	0	1	1	0	1				1	0	s	0	0	0
1	0	1	1	1	0				1	0	s	0	0	0
1	0	1	1	1	0				1	0	s	0	0	0
1	0	1	1	1	0				1	0	s	0	0	0
1	0	1	1	1	0				1	0	s	0	0	0
1	1	2	1	1	0				1	1	s	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	0	0	0	h	0	0	0
0	0	0				0	0	1	0	0	h	0	0	0
0	0	0				0	0	1	0	0	h	0	0	0
0	0	0				0	1	0	0	0	h	0	0	0
0	0	0				0	1	0	0	0	h	0	0	0

0	0	0				0	1	0	0	0	h	0	0	0
0	0	0				0	1	1	0	0	h	0	0	0
0	0	0				1	0	0	0	0	h	0	0	0
0	0	0				1	0	0	0	0	h	0	0	0
0	0	0				1	0	1	0	0	h	0	0	0
0	0	0				1	1	0	0	0	h	0	0	0
0	0	0				1	1	0	0	0	h	0	0	0
0	1	1				0	0	0	0	1	h	0	0	0
0	1	1				0	1	1	0	1	h	0	0	0
1	0	1				0	0	0	1	0	h	0	0	0
1	0	1				0	0	0	1	0	h	0	0	0
1	0	1				0	0	0	1	0	h	0	0	0
1	0	1				0	0	0	1	0	h	0	0	0
1	0	1				0	0	1	1	0	h	0	0	0
1	0	1				0	1	0	1	0	h	0	0	0
1	0	1				0	1	1	1	0	h	0	0	0
1	0	1				0	1	1	1	0	h	0	0	0
1	0	1				1	0	0	1	0	h	0	0	0
1	0	1				1	0	1	1	0	h	0	0	0
1	1	2				0	0	0	1	1	h	0	0	0
1	1	2				0	0	1	1	1	h	0	0	0
1	1	2				0	1	0	1	1	h	0	0	0
1	1	2				0	1	1	1	1	h	0	0	0
1	1	2				1	0	0	1	1	h	0	0	0
1	1	2				1	1	0	1	1	h	0	0	0
1	1	2				1	1	0	1	1	h	0	0	0
1	1	2				1	1	0	1	1	h	0	0	0
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	0				1	0	s	1	0	1
0	0	0	0	0	1				1	0	s	1	0	1
0	0	0	0	1	0				1	0	s	1	0	1
0	0	0	0	1	0				1	0	s	1	0	1
0	0	0	0	1	0				1	0	s	1	0	1
0	0	0	0	1	0				1	0	s	1	0	1
0	0	0	0	1	0				1	0	s	1	0	1
0	0	0	0	1	1				1	0	s	1	0	1
1	0	1	0	1	1				1	1	s	0	1	1
0	0	0	1	1	0				0	1	s	0	1	1
0	0	0	1	0	0				1	0	s	1	0	1
0	0	0	1	0	0				1	0	s	1	0	1
0	0	0	1	0	1				1	0	s	1	0	1
0	0	0	1	1	0				1	0	s	1	0	1
1	0	1	1	0	0				1	1	s	0	1	1

1	0	1	1	0	0				1	1	s	0	1	1
0	1	1	1	0	1				1	1	s	1	0	1
0	1	1	1	1	0				1	1	s	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	0	1	0	h	1	0	1
0	0	0				0	0	1	1	0	h	1	0	1
0	0	0				0	0	1	1	0	h	1	0	1
0	0	0				0	1	0	1	0	h	1	0	1
0	0	0				0	1	0	1	0	h	1	0	1
0	0	0				1	0	1	1	0	h	1	0	1
0	0	0				1	0	1	1	0	h	1	0	1
0	1	1				0	0	0	1	1	h	1	0	1
1	0	1				0	0	0	1	1	h	0	1	1
1	0	1				0	0	0	1	1	h	0	1	1
1	0	1				0	0	1	1	1	h	0	1	1
1	0	1				0	0	1	1	1	h	0	1	1
0	1	1				0	1	0	1	1	h	1	0	1
1	0	1				0	1	0	1	1	h	0	1	1
0	1	1				0	1	1	1	1	h	1	0	1
1	0	1				0	1	1	1	1	h	0	1	1
0	0	0	0	1	0				1	1	s	1	1	2
0	0	0	1	0	1				1	1	s	1	1	2
0	0	0				0	0	0	1	1	h	1	1	2
0	0	0				0	0	0	1	1	h	1	1	2
0	0	0				0	1	0	1	1	h	1	1	2
0	0	0				0	1	0	1	1	h	1	1	2
0	0	0				0	1	0	1	1	h	1	1	2
0	0	0				0	1	1	1	1	h	1	1	2
0	0	0				1	0	1	1	1	h	1	1	2

Category: Number Sense
Experiment: 1
School: North High
Sample: School-wide Results as of April 25th, 2007

Pre-Test		Scaffolding		Hints		Post-Test		Gain Scores		
# 21220	# 21241	# 13599	# 15005	# 15636	# 15646	# 13389	# 14557	Gain1	Gain2	GainSum
0	1	0	1			1	1	1	0	1
0	1	0	0			0	1	0	0	0
0	1	1	0			0	1	0	0	0
1	1	1	0			1	1	0	0	0
0	0			1	0	1	0	1	0	1
0	1			1	0	0	1	0	0	0
0	1			1	0	0	1	0	0	0
0	1			1	0	0	1	0	0	0
1	1			1	0	1	1	0	0	0
1	1			0	0	1	1	0	0	0
1	1			1	0	1	1	0	0	0

Category: Number Sense
Experiment: 2
School: North High
Sample: School-wide Results as of April 25th, 2007

Pre-Test		Scaffolding		Hints		Post-Test		Gain Scores		
# 21260	# 21264	# 15012	# 13336	# 15648	# 15632	# 13249	# 13364	Gain1	Gain2	Gain Sum
0	0			1	0	0	1	0	1	1
0	1			1	0	0	1	0	0	0
0	0			1	0	0	1	0	1	1
1	1			1	0	1	1	0	0	0
1	0			1	0	1	0	0	0	0
1	1			1	0	1	1	0	0	0
1	1			1	0	1	1	0	0	0
1	1			1	0	1	1	0	0	0
1	1			1	0	1	1	0	0	0
1	1			1	0	1	1	0	0	0
1	0	0	0			1	0	0	0	0
0	1	0	1			1	1	1	0	1
0	1	1	0			0	1	0	0	0
1	1	1	0			1	1	0	0	0
1	1	1	0			1	0	0	-1	-1
1	1	1	0			1	1	0	0	0

Category: Number Sense
Experiment: 4
School: North High
Sample: School-wide Results as of April 25th, 2007

Pre-Test		Scaffolding		Hints		Post-Test		Gain Scores		
# 21300	# 21304	# 13594	# 12876	# 15635	# 15440	# 8857	# 14818	Gain1	Gain2	GainSum
1	1	0	0			1	1	0	0	0
1	0	0	0			1	1	0	1	1
1	0	0	1			1	0	0	0	0
1	1	0	1			1	1	0	0	0
1	1	0	1			1	1	0	0	0

1	1	0	1			1	1	0	0	0
1	1	0	1			1	1	0	0	0
1	1	1	0			1	1	0	0	0
0	0			0	0	0	1	0	1	1
1	1			0	0	1	1	0	0	0
1	0			0	0	1	0	0	0	0
0	1			0	0	1	0	1	-1	0
1	1			0	1	1	1	0	0	0
1	1			0	1	1	1	0	0	0
1	1			0	1	1	1	0	0	0
1	1			0	1	1	1	0	0	0
1	1			0	1	1	1	0	0	0
0	0			0	1	1	0	1	0	1
1	0			1	0	1	0	0	0	0
1	0			1	0	1	1	0	1	1