Effectiveness of Complete Explanations vs. Hints Tutoring using ASSISTments

An Interactive Qualifying Project Report

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By

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Abstract

A comprehensive set of problems covering unit conversion, area, perimeter, circumference, surface area and volume were created. Each problem was created with identical tutoring content presented to students in one of two ways: hints, or complete explanations. A study was then run using these problems sets to acquire data with the hope of determining which type of tutoring is more effective. Students were randomly given either one type of tutoring for each problem set that they attempted.

In order to determine which type of tutoring was more effective learning, time required to master, and number of attempts to master was considered. After the data was analyzed, we were able to conclude that Hints tutoring was more effective for the easiest problem sets as well as for area, perimeter, surface area, and volume problems. Complete explanation tutoring was more effective for unit conversion problems. Also, students were less likely to be able to master Complete Explanation problems than Hints problems. Although there was a trend that above average students learn better from complete explanation tutoring while above average students learn better from hints tutoring, there was not enough data to yield a statistically reliable conclusion

Acknowledgements

We would like to acknowledge all of the people who made this study possible ranging from our advisors WPI students who are continually improving the ASSISTments system to the teachers who assigned large numbers of our study problem sets to their students. Professor Neil Heffernan and Cristina Heffernan continually aided our efforts with suggestions, guidance, and content reviews. We also would like to thank Matt Dailey for reporting all of our data to us in spreadsheet form to facilitate analysis. Thanks to everyone who made this project possible.

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Introduction

The first goal of this Interactive Qualifying Project (IQP) was for our team to create a new set of variablized measurement problems, which involved skills of Area, Surface Area, Volume, and Unit Conversion. While ASSISTments did previously exist for these skills, they were not variablized and were not complete or consistent. The skills were divided among the three team members as we sought out to create a new, comprehensive variablized set of problem sets for the Measurement skills.

In addition to creating an entirely new set of ASSISTments for the Measurement skill, we also setup and ran a study based on the Razzaq and Heffernan's study of the effectiveness of Tutor Problem Solving vs Solutions.[1] The second goal of our study was to determine whether optional hints or complete explanations are more effective in helping a student learn a particular concept. In order to test this we constructed our problem sets in such a way that each student would randomly be given ASSISTments with hints or complete explanations. This way, we can compare factors such as increases in proficiency or time to complete problem sets. By analyzing these and other results found from our data, we can determine which tutoring method will be most effective for helping students learn new mathematical concepts. The methodology, results and analysis of our results are discussed later in the body of this report.

1 Background

In 2003, ASSISTments started as an idea of Neil Heffernan and Ken Koedinger. The intelligent tutoring system is funded by the US Department of Education, the Office of Naval Research and the National Science Foundation. In 2009, over four thousand students, mainly located in and around Worcester County, Massachusetts have used ASSISTments. ASSISTments is an entirely web based math tutoring for grades 4 through 10. The word "ASSISTments" is a blend of tutoring or "assistance" and "assessment". ASSISTments effectively helps students master over 120 skills, while giving teachers an effective way of quickly and easily assessing a students performance. ASSISTments can generate detailed reports that outlines any particular students strengths or weaknesses. There are hundreds of problem sets created by Worcester Polytechnic Institute (WPI) students that teachers can assign, and additionally, they can create there own content [2].

1.1 Other Systems

1.1.1 Mastering Physics

Mastering Physics is an online system that accompanies Young and Freedman's University Physics Textbook, a freshman level physics textbook. The system is designed to allow a teacher to assign homework assignments to students online rather than in the typical manner, allowing instant feedback of the performance of students. It is one of several programs designed to accompany the textbooks created by the same publisher as the textbook [3].

An activation code for the website comes with the purchase of a new textbook, although if you buy the book used, or used the code for an earlier class, the textbook might not have this activation code with it. If there is no activation code, a student must buy one in order to make an account. The activation code, unless that code has already been used, will allow the user to create an account, which is then linked to a specific class. Students are given access to the problems assigned by the instructor and to past performance. The instructor also needs a code to create an account, but this is obtained through communications between the university and company as is typical for the instructor manuals, rather than being directly bought online.

The format of Mastering Physics problems includes free answer (essay), multiple choice, and text answer. Since physics equations tend to often be long with many mathematical operations and variables, the text entry capabilities of Mastering Physics are very advanced. The content of Mastering Physics is very similar to textbook problems, although in some cases, the problems may be different. Because the questions are online instead of in-print, there is the capability for problems to contain animations, and other large and too expensive to print color images.

The system is designed as an online homework system, giving students instant feedback on how well they do on the homework assignments. As such, the program has a specific time at which the problems need to be completed, otherwise they are considered late. Late penalties can be specified by the teacher to modifying the grades. It is possible to get partial credit on a problem. If a problem is answered incorrectly on the first try, a student can try again. Each time a student attempts a problem they are penalized. The instructor can set the maximum allowable number of attempts for a problem. At the end, if the student desires, that student can accept no credit for the problem and view the answer to it.

There is also a system of hints. For more complicated open response questions, there are hints available to help the student solve the problem. Hints can be opened in any order, although they have a specified order to determine what aspect of the problem each hint gives a hint about . Students earn more points for problems which they use less hints for. Typically, a limited number of bonus points are added to scores for each problem, up to the maximum score for the problem. Hints in the form of a question that must be answered do not have additional hints available to the student.

1.1.2 Carnegie Learning

Carnegie Learning is a web-based online problem solving and tutoring program founded by cognitive and computer scientists from Carnegie Mellon University. The tutoring system can be used in conjunction with Carnegie Learning Math textbooks, or as a stand-alone tutoring software. The software requires a license, can be purchased directly from Carnegie Learning. Carnegie Learning offers a blended curriculum program where students spend 60% of their time learning in classrooms using the textbook as well as 40% of their time learning using the cognitive tutor software[4].

The cognitive tutor software gives the students access to lessons, which provide the student with "lecture type" instruction, as well as practice problems. Figure 1 below shows a sample lesson on the Pythagorean Theorem. The lesson has key terms boxed to the left and also has a box of skills required and learned in the unit. If a student needs a key term defined, they can click on the link and a definition window will pop up as shown in Figure 2.

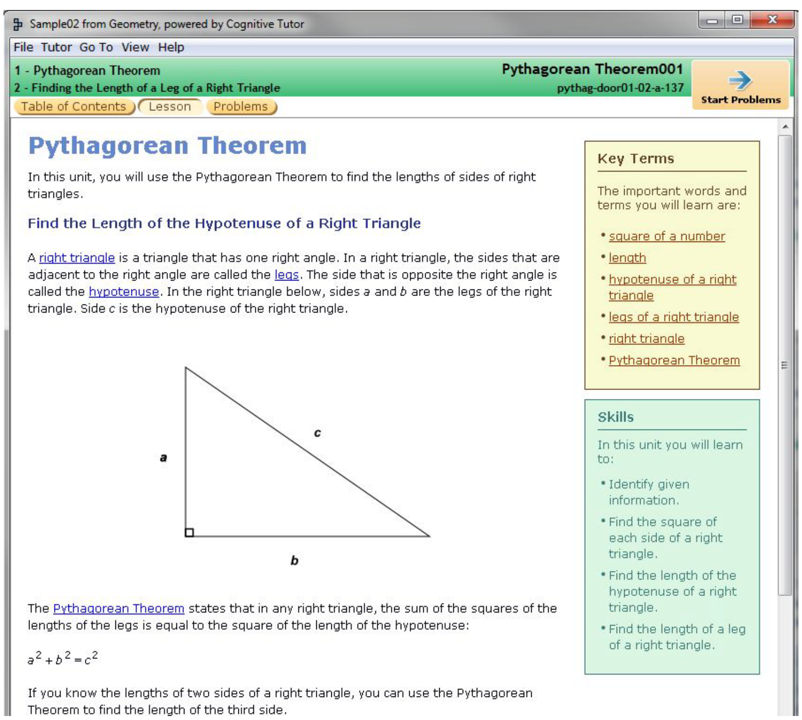


Figure 1: Sample Carnegie Learning Lesson: ©2010 Carnegie Learning [5]. Used with permission

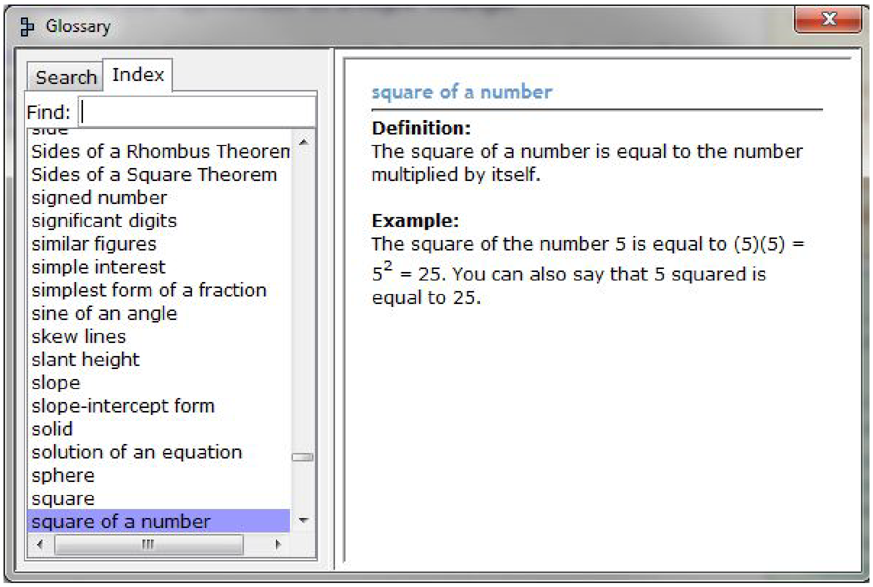


Figure 2: Sample Carnegie Learning Definition: ©2010 Carnegie Learning [5]. Used with permission

Below is a sample problem from the Pythagorean Theorem unit. In this problem, students are given information on the size of the diagonal of the door and the height of the door. The student is asked to fill out the spreadsheet below, which requires diagram labels and lengths to be filled in. The order of the fields in the spreadsheet made it difficult to solve the problem because the first field is for the width of the door. Logically one must calculate the squares of each dimension first before calculating the unknown side of a triangle. The spreadsheet is very comprehensive in asking students not only for the length of particular quantities, but also for the label on the diagram. If an answer is incorrect, a red box appears and if the mouse is moved over the box, a a message appears telling you about your error. The spreadsheet allows for students to enter values in algebraic format (i.e. 4^2 or 16 could be entered if the answer is 16). Students have the option of asking for hints or complete worked examples by clicking the relevant button at the top of the window as shown in Figure 3.

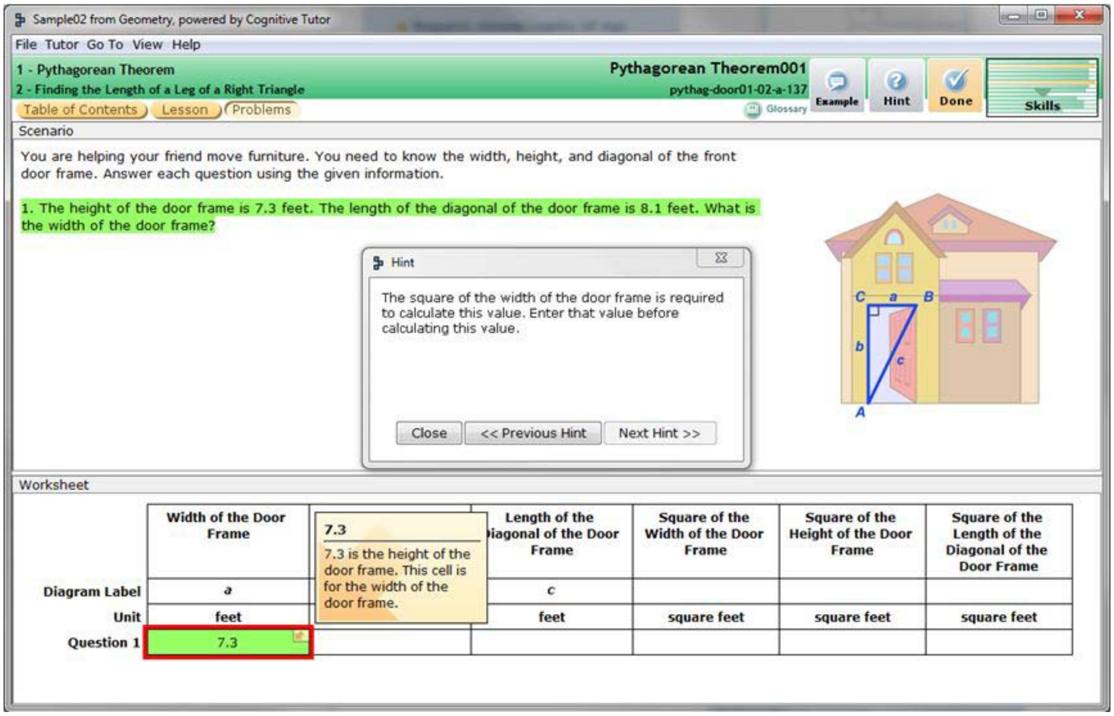


Figure 3: Sample Carnegie Learning Problem: ©2010 Carnegie Learning [5]. Used with permission

Figure 4 below shows what students see if they click the skills button. This "skillometer" is a way for students to visually see what skills they need the most work on.

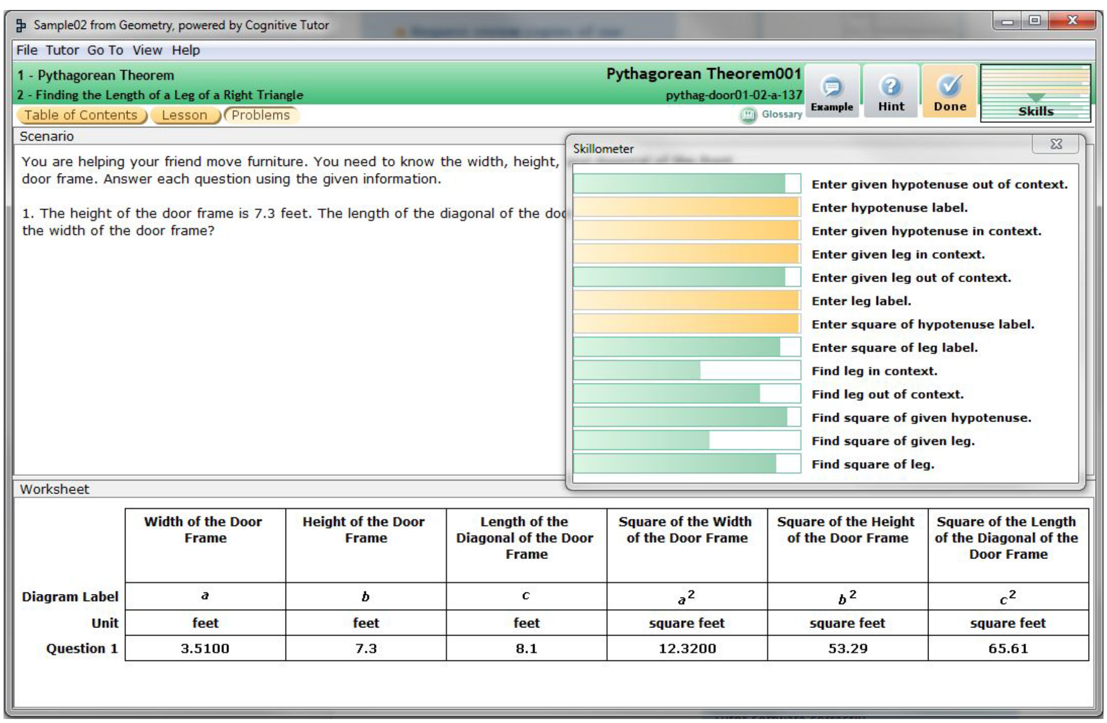


Figure 4: Sample Carnegie Learning Lesson: ©2010 Carnegie Learning [5]. Used with permission

1.2 ASSISTments

ASSISTments is a full function web based tutoring program that allows teachers to develop, assign and access problems and tutoring that students use to improve their math skills .

1.2.1 Developing Content

While there are hundreds of ASSISTments certified problem sets, teachers have the option of creating their own content using the builder built into the web-based ASSISTment system. All content developed for this study were created using the builder. The builder can be accessed on any teacher account by clicking the Build tab and then the Assistments tab as shown below in Figure 5. To create new content the "Create New Assistment" link must be clicked.

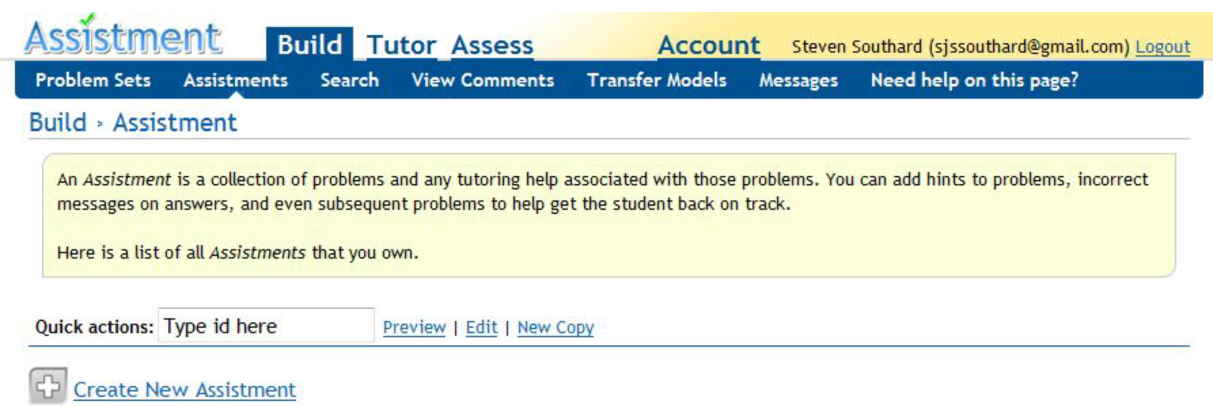


Figure 5: Accessing the ASSISTments builder, ©2010 WPI

The ASSISTment builder allows for the creation of either standard templates, which have static numbers or or variablized templates. There are several different types of problems that can be created, such as: Rank, Fill in, Check all that apply, Algebra, Multiple choice, Ungraded open response, and even Externally processed problems using Flash or Java. The main problem is created in the text editor window, and answers and tutoring strategies can be added by clicking either "New Answer" or "New Strategy". A screenshot of the ASSISTment builder is shown below in Figure 6.

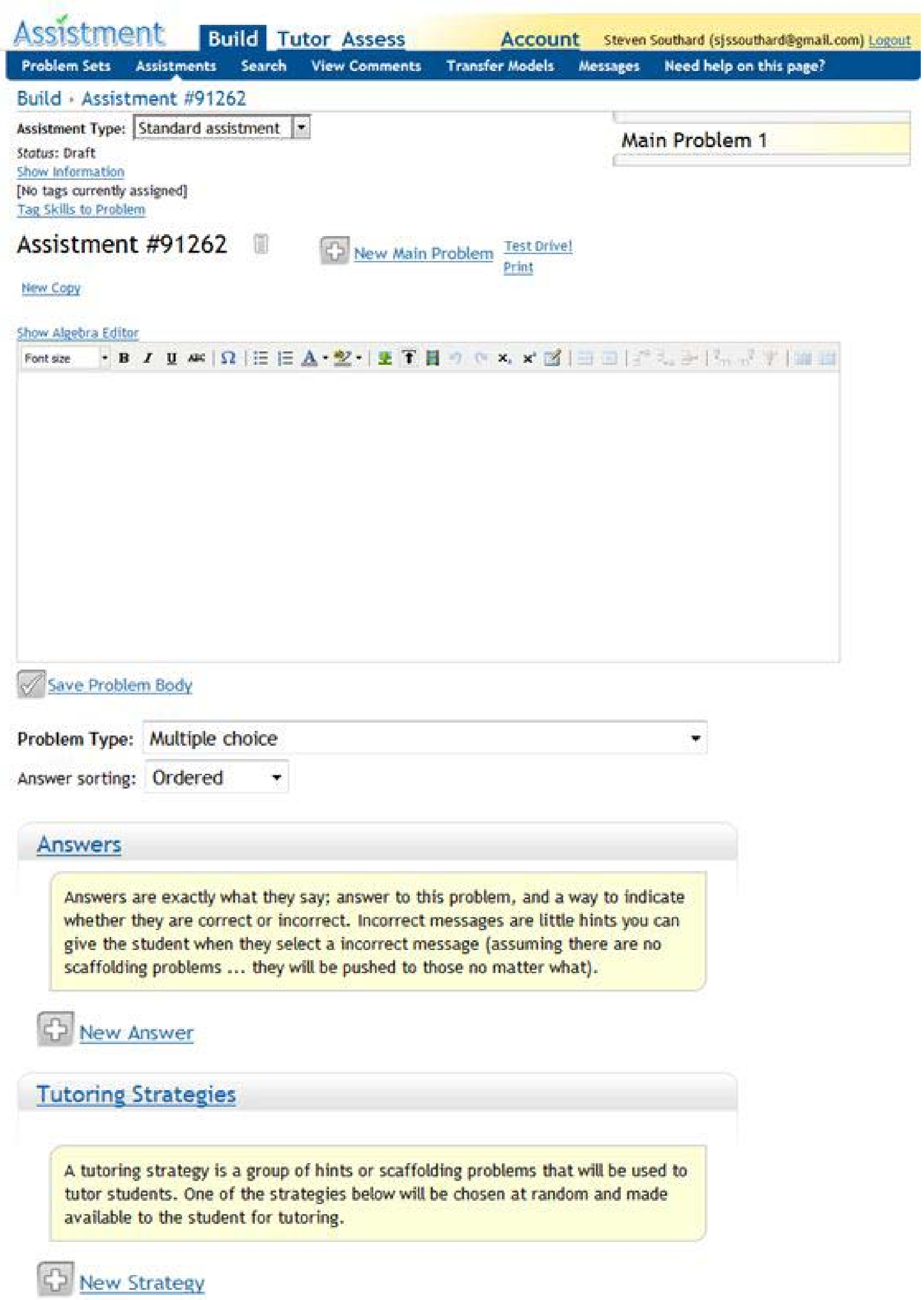


Figure 6: ASSISTments Builder, ©2010 WPI

1.2.2 Assigning Content

Teachers can easily assign problem sets to students using the assess tab once they are logged into their account. From this page, they see a list of all the classes that they are teaching. New classes can be added by clicking the "New Class" link as shown below in Figure 7.

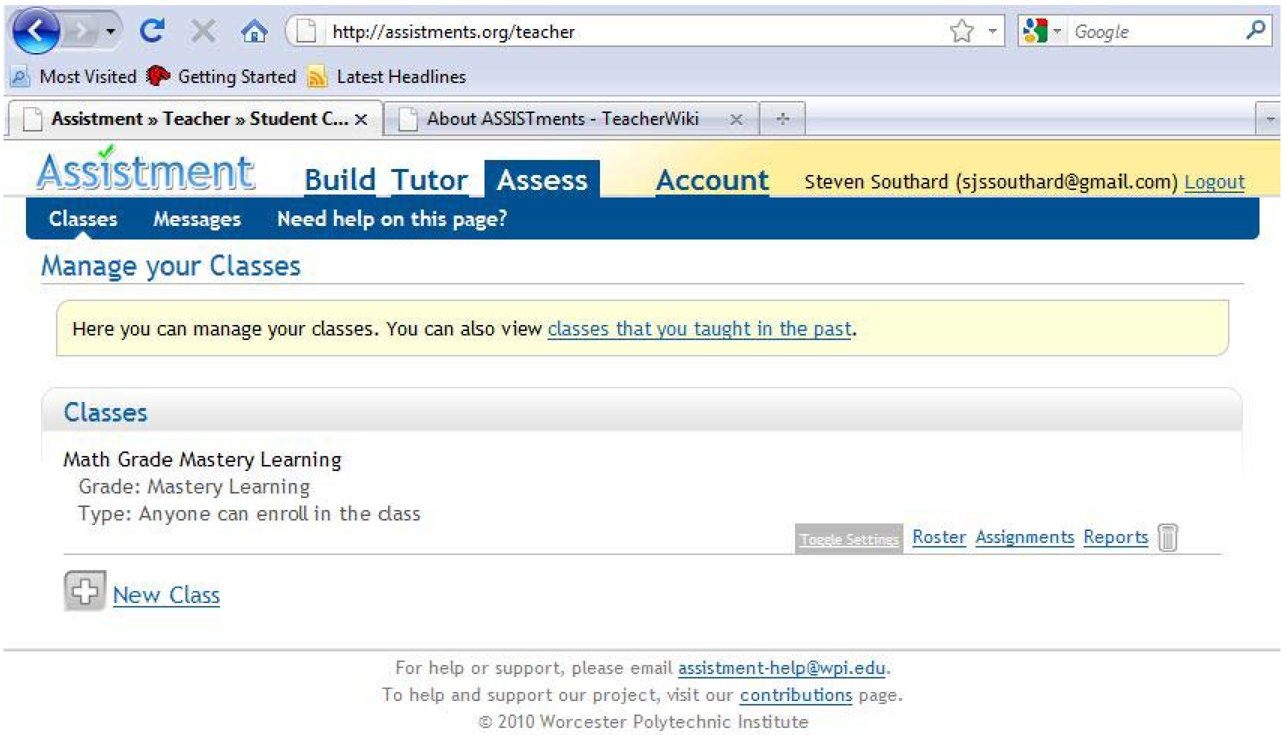


Figure 7:Adding Classes in ASSISTments, ©2010 WPI

Once the new class link button is clicked, a screen similar to what is shown below in Figure 8 will be displayed. Here the teacher can create a single class or multiple classes. They can set the grade level, class name, and access restriction. Access can either be unrestricted, or set so that a teacher must accept a student's request to join a class. In order to create the class, the "Save" button must be pressed.

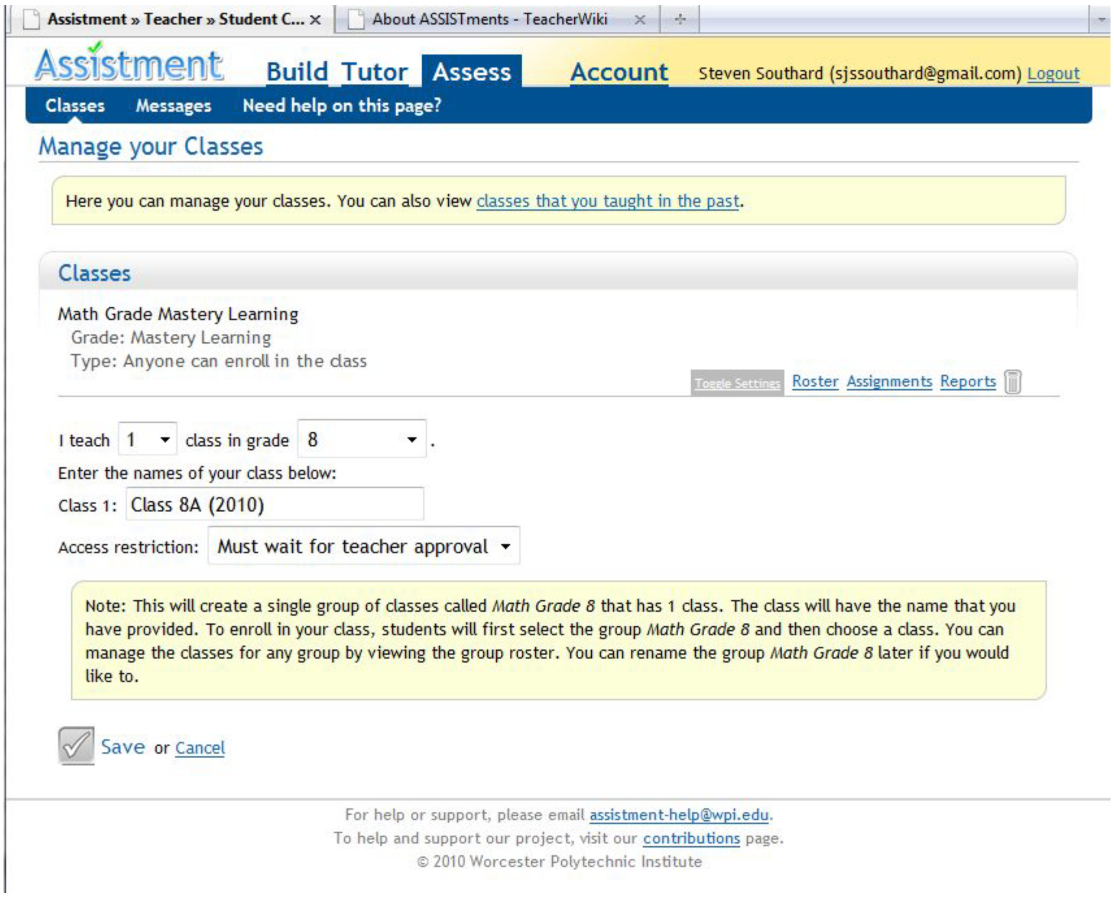


Figure 8: Class Settings in ASSISTments, ©2010 WPI

Once a class is created, the teacher can assign content to the students by clicking the "Assignments" link. The content is organized in a folder list system as shown below in Figure 9. The teacher can then assign either the entire folders (skills) or individual problem sets (sub-skills). Once the problem set is assigned, teachers can edit the due date and the date in which the assignment will appear in a students "my assignments" list.

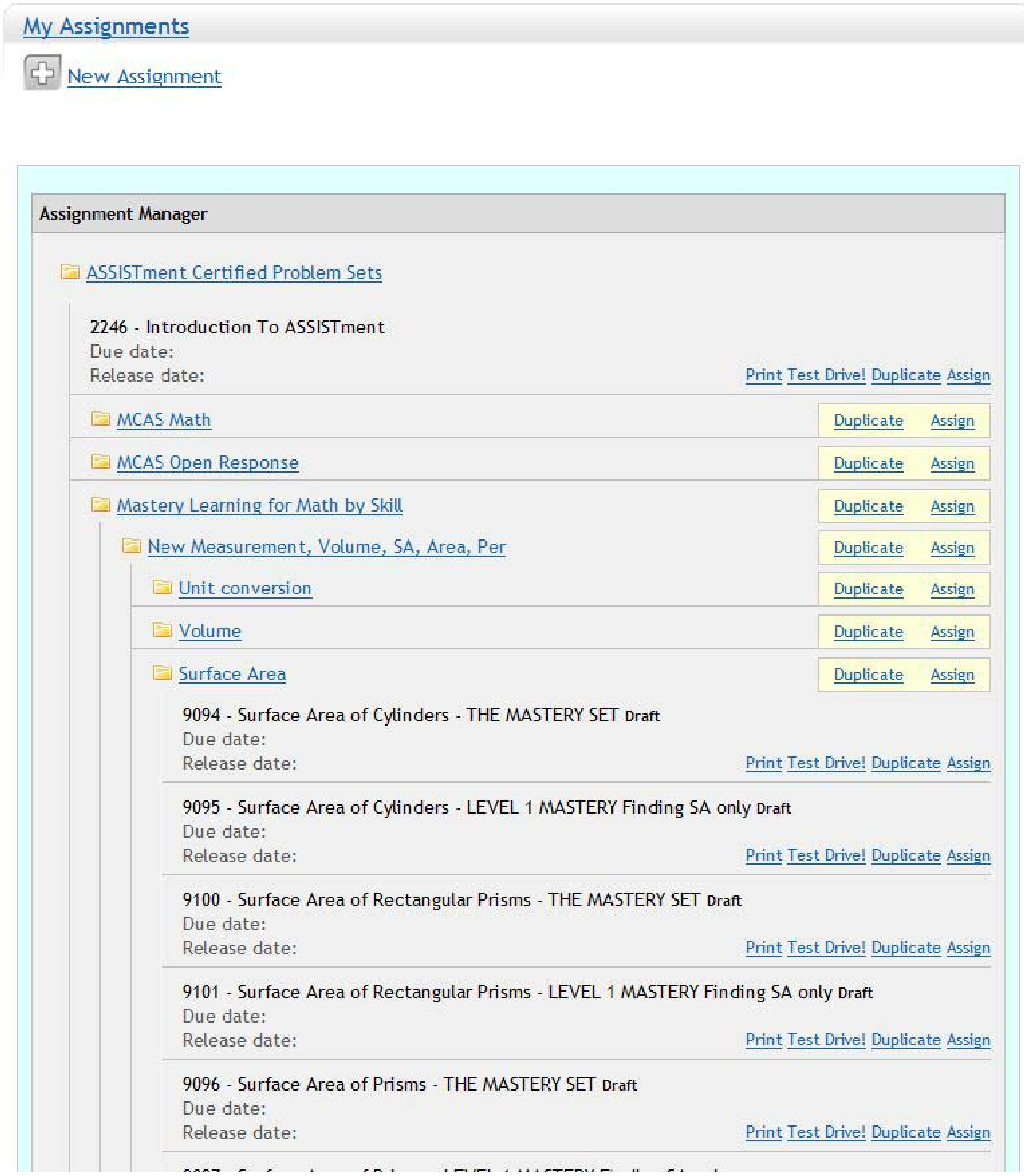


Figure 9: Selecting Problem Sets in ASSISTments, ©2010 WPI

1.2.3 Viewing Content

When a student logs into ASSISTments, they will see a screen similar to what is shown below in Figure 10. Once a student is enrolled in a class, they are able to see all of the Assignments that his or her teacher has assigned by clicking on the "Show Assignments" link.

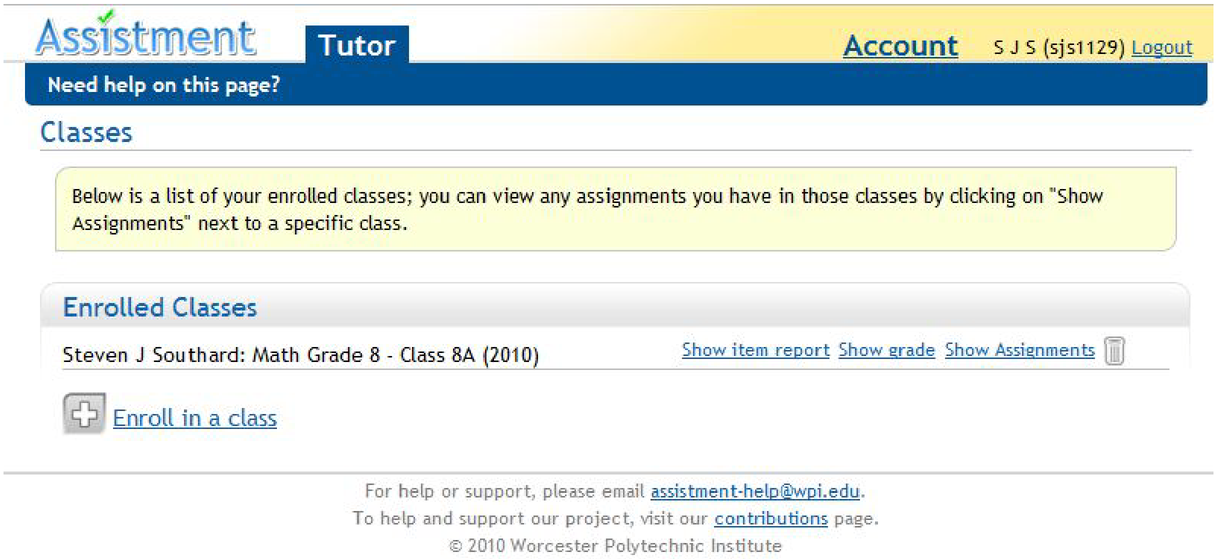


Figure 10: Student View of ASSISTments, ©2010 WPI

Once the student clicks on the "Show Assignments" link they will see a screen similar to the one shown below in Figure 11. All of the incomplete assignments are shown on this page as well as due dates, if they have been assigned. Students can also access older content by clicking on the "Show old completed assignments" button. From this list it is very easy for a student to choose an assignment to complete.

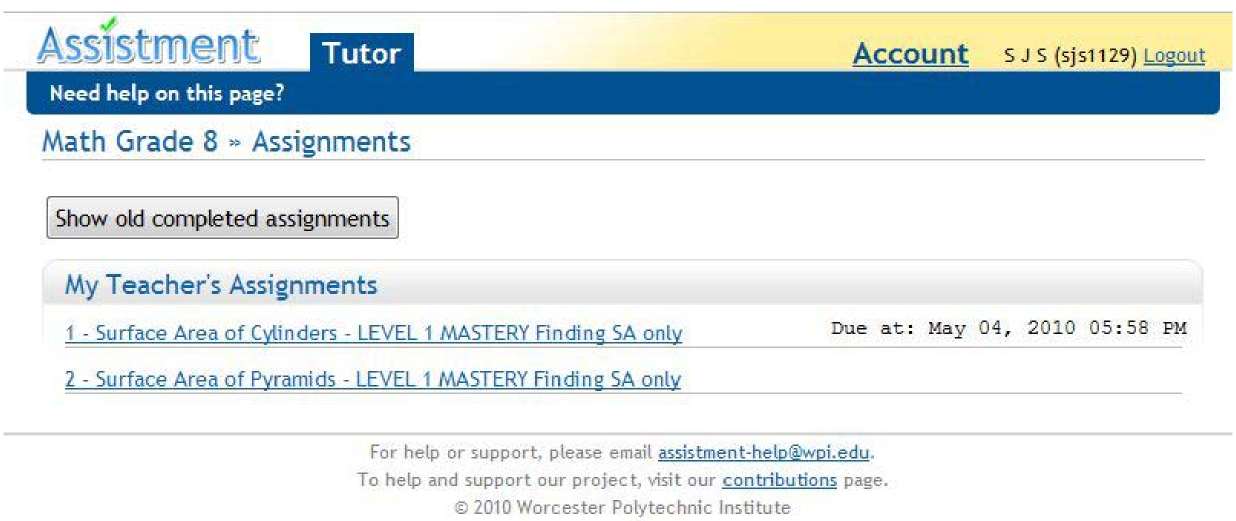


Figure 11: Student View Selecting ASSISTment Problem Set, ©2010 WPI

Once the student clicks the link for a particular problem set, they will begin the problem set. All content in this study (which is described later in this report) is mastery learning content. This means that a student has to get a particular number of questions in-a-row correct to "master" a skill (typically 3 or 5). The student will continue to be given new problems until they master the skill or reach a predetermined daily limit.

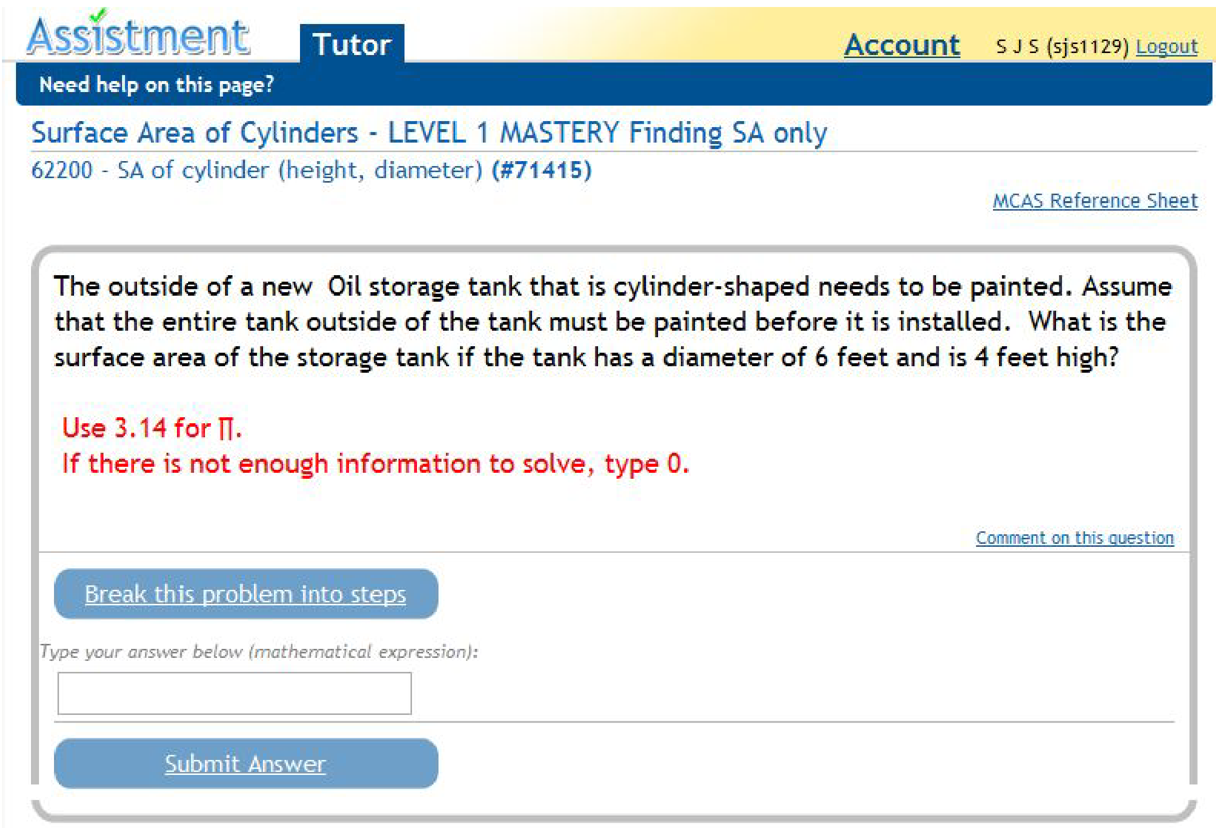


Figure 12: Sample ASSISTment Problem, ©2010 WPI

Once a student completes a problem set, a screen similar to that shown below in Figure 13. From this screen the student can easily access another assignment by clicking on the "Back to Assignments" link, which is prominently displayed on the screen.

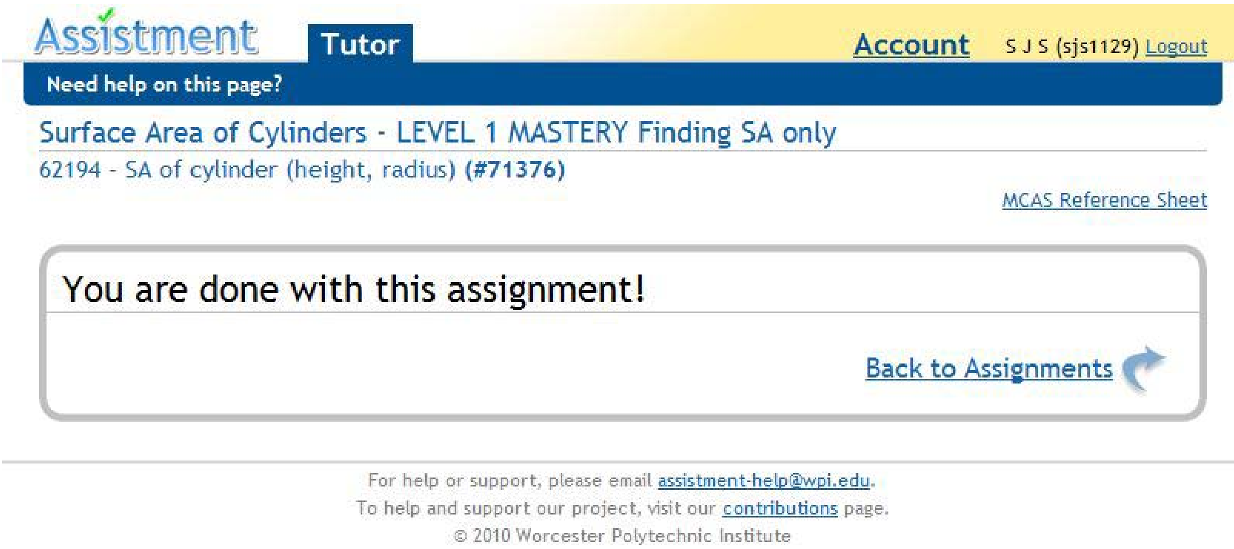


Figure 13: Assignment Complete Message in ASSISTments, ©2010 WPI

1.2.4 Assessing Results

ASSISTments allows teachers to quickly and easily assess students progress by viewing reports. Reports are accessed by clicking the report link on the Asses page as shown in Figure 14.

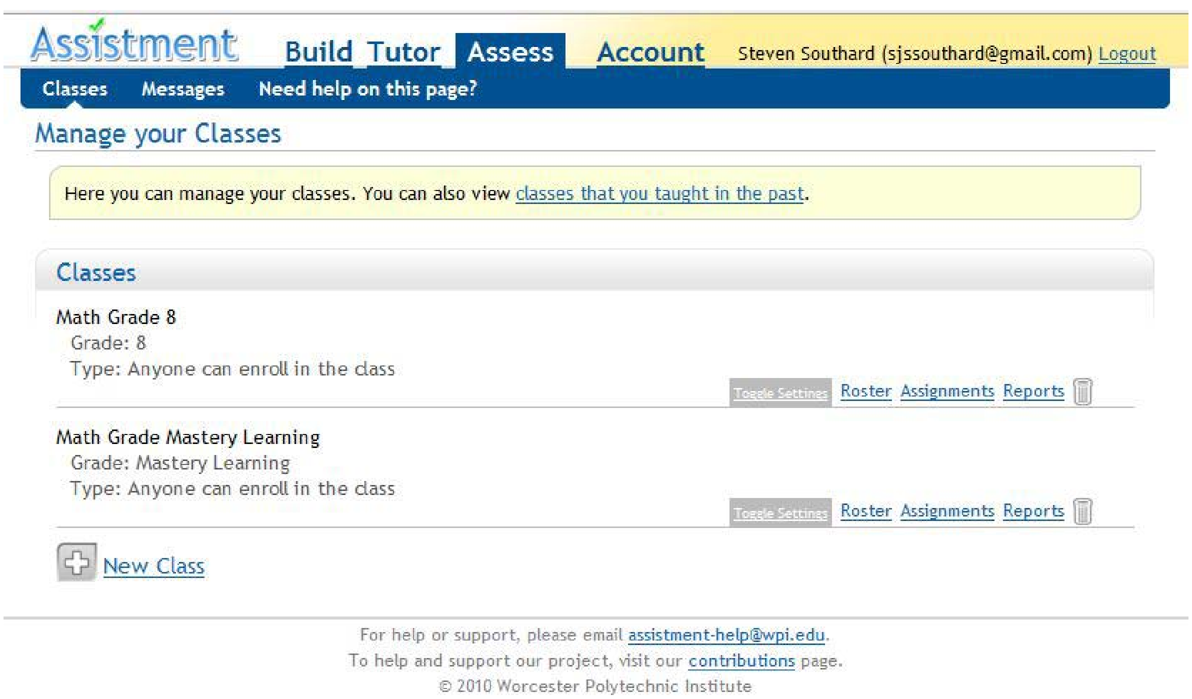


Figure 14: Assessing Results in ASSISTments, ©2010 WPI

A sample report is was generated for 2 anonymous students, to highlight some of the features that teachers can easily access to assess students. Teachers are given each students average as well as the class average. They can see what each student answered on each individual ASSISTment, as well as whether the answer was correct or incorrect. Teachers can see the average on a problem by problem basis or for the overall problem set. The percentage of students who asked for help (hints or complete explanation) is also displayed. Additionally, if there are any common wrong answers, the report displays them near the top of the page. This information could be helpful for teachers, because it allows them to see if students are making the same mistakes.

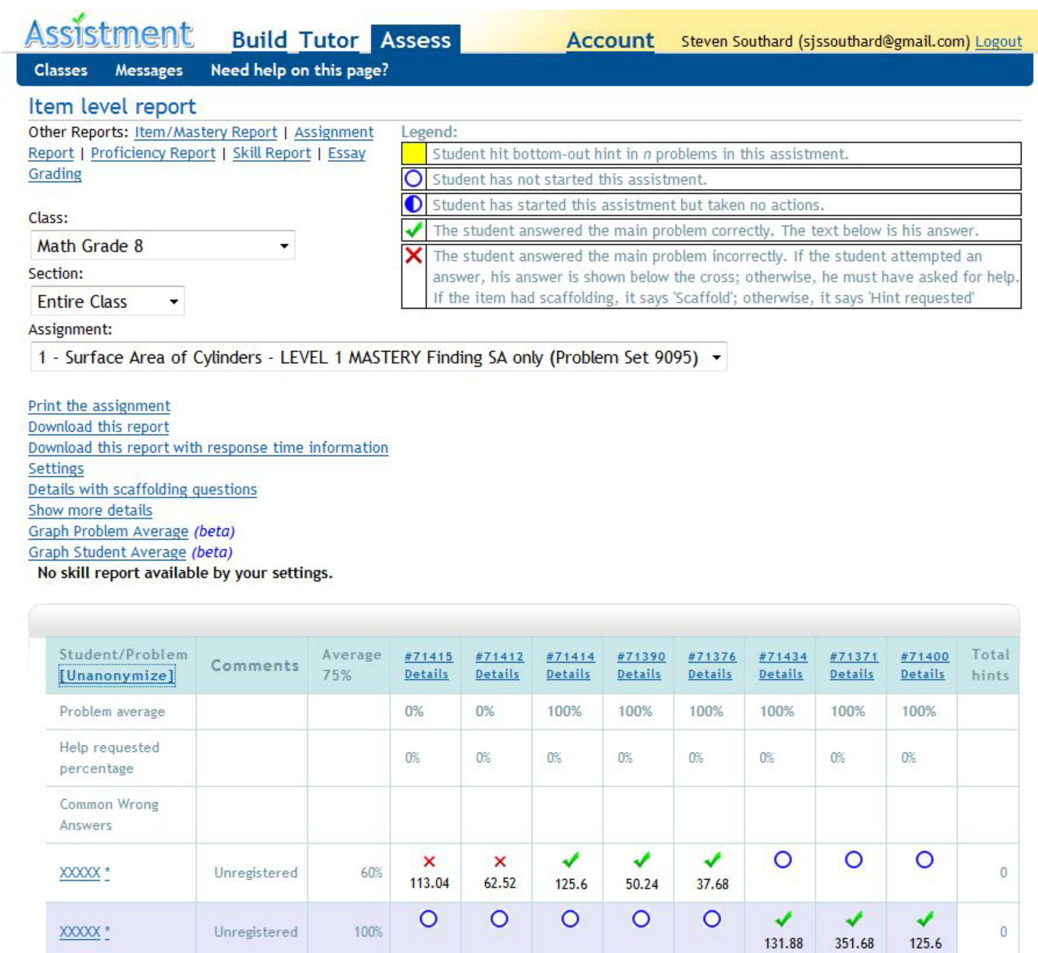


Figure 15: Sample Report in ASSISTments, ©2010 WPI

1.3 Comparison of Systems

All of the aforementioned systems are web-based programs. They are accessed through a website or a web-applet. The difference between web applet based programs and client-server setups is that the server-client setups save information on the client computer and the client computer must install a program to interact with the server. Each of the web-based tutoring systems uses student accounts, providing instant information to the student on the correctness of the students responses. They can provide hints, scaffolding, or other forms of assisting the student solve the problem. They can also allow the student to try again, but are limited to the responses that can be typed into the computer, therefore not being able to record the work done by the student to get the answer. Most, if not all, have teacher accounts as well, which allows the teacher to assign and grade homework over the web.

Both Mastering Physics and Carnegie Learning, are commercial products that have a financial cost associated with them. ASSISTments is non-commercial, it is funded by grants. [7] Because of the ongoing research and development within the ASSISTments community, the program is constantly developed and updated. While this is not unusual, ASSISTments is unique in the way which teachers and students are involved in upgrades and developing new content. Every year, WPI students perform research studies using ASSISTments and the results are implemented to improve the overall quality of the ASSISTments. The goal of the improvements are not to create a more attractive product, but rather a more useful system.

While ASSISTments may not be the most flashy of the 3 systems compared in this report, there are many ways in which it is the most appropriate for research. ASSISTments has many built in ways that research studies can be conducted without the students ever even knowing. ASSISTments also has a problem builder that is available to the public, which means any teacher can create problems that fit their teaching style, which is an added bonus. This feature also allows students at WPI to create problems that can be used to design research studies attempting to improve the quality of tutoring and ultimately to improve students mathematical skills. ASSISTments is currently focused on elementary and high school students, while Mastering Physics and Carnegie Learning are more geared toward high school and college students.

2 Project Goals

We have two major goals for this IQP study. The first goal for our project is to build ASSISTment problems in the area of measurements for the middle school students. The second goal is to compare the effectiveness of "Complete Explanation"and "Hint" tutoring using randomly selected students.

2.1 Building Assistments

Our group have created the ASSISTments that fall under the measurement catagory. We have developed a total of 23 major skills and 13 sub skills, all of which are listed below:

- Volume of Cylinder
- Volume of Spheres
- Volume of Pyramids
- Volume of Cones
- Volume of Prisms
- Volume of Rectangular Prisms
- Surface Area of Cylinders
- Surface Area of Prisms
- Surface Area of Pyramids
- Surface Area of Rectangular Prisms
- Surface Area of Cones
- Surface Area of Spheres
- Unit conversion within a system
- English Length
- English Volume
- English Mass
- Metric Length

- Metric Volume
- Metric Mass
- Time
- English
- Metric
- Single Conversions
- Double Conversions
- Unit conversion between systems
- Length Conversions
- Non-Length Conversions
- Linear area volume conversion
- Area of Circle
- Area of Irregular Shape
- Area of Parallelogram
- Area of Rectangle
- Area of Triangle
- Area of Trapezoid
- Perimeter
- Circumference

For each skill, an average of six or seven ASSISTment templates were created to test the student's knowledge about the subject, provide the students with the practice of using essential skills, and aid students in learning concepts that they may be struggling with. As an example, the Area of Triangle skill with six ASSISTments will be used to demonstrate the ASSISTments building. The area of the triangle is calculated by 1/2 x Base x Height. There is always an ASSISTment in each skill set that will test the most basic knowledge about the particular skill, in this case, ASSISTment #1 will ask the students to find the area of a triangle with base and height given. ASSISTment #2 will also ask the area with given base and height, but the triangle is changed to a right triangle. In ASSISTment #3, the question stays the same, but the triangle is changed to an obtuse triangle with the height labeled outside the triangle. ASSISTment #4 will not only provide the necessary information of base and height, but the triangle will also include an extra labeled line to test whether the students know the correct lines to use. In ASSISTment #5 and #6, the students are asked to solve the problem in the opposite order. In #5, the area of the triangle as well as the height are given; the students are expected to calculate the base from the given information. In #6, the area of the triangle and the base are provided and the student must solve for the height. The goal of creating the ASSISTments was to vary the difficulty of the problems. Instances of each ASSISTment template are created and grouped into a Mastery Learning problem set. Each problem set typically has between 8 and 20 instances of each template in it. The easier problems (ASSISTments #1-4) are grouped into a Level 1 problem set, giving teachers flexibility as to how much they want to challenge their students.

2.2 Creating Problem Sets

Two types of ASSISTments, "Complete Explanation" and "Hints", are built for each skill set. A mastery problem set is then created for each skill that contains both the "Complete Explanation" and "Hints" version of the ASSISTment. Students are randomly assigned a type of problem in each problem set they attempt. This means that once a student starts a skill and asks for tutoring, they will either receive all "Hints" tutoring or all "Complete Explanation" tutoring. More information regarding the types of tutoring can be found in the experimental design portion of this report.

Problem Sets had to be assembled manually, instead of directly from templates which is the typical way to create ASSISTment problem sets. The reason for this is because the automated problem set wizard in ASSISTments could not implement the random choose condition, which assigns students problems only with a specific type of tutoring. To manually create problem sets we had to first create a problem set which was named using the convention of "Name - PROBLEM SET TYPE". The type of the main problem set was set to linear. Next, a new section had to be added that would implement the choose condition. Two subsections were then added: one with approximately 100 "Hints" problems and another with approximately 100 "Complete Explanation" problems. A comma separated list of ASSISTment IDs were then added to each subset. The problem set type for the subset was set to Mastery. Once the mastery problem set was selected, Mastery settings could be entered. Typical settings for our problem sets are 3 problems in-a-row to master, no more than 10 attempts per day, and no way to test out of a problem set.

2.3 Content Summary

Nearly all of the ASSISTments were created by the authors of this report. Previous ASSISTments available for this skill were consulted, but new content was favored so that the format and style of the questions would be as consistent as possible.

2.3.1 Conversion Problems - ASSISTment # 56790 / 20260 (Beth)

The following two ASSISTments are examples of converting units within a system. Both ASSISTments solve the same problem; however, they use two different approaches called "Hints" and "Complete Explanation". The Hints version of the ASSISTments breaks down the problem step by step w if the student clicks the "Show me hint" button. The Complete Explanation variation shows all the tutoring at once when the student enters the incorrect answer or click the "Break this problem into steps" button.

First, a sample ASSISTments #56790, is shown in Figure 16. ASSISTments #56790 is Hint version of the problem of converting a measurement in ounces to pounds, with all the hints displayed. When a student enters an incorrect answer in the box, the student is told the answer is incorrect and is given the ability to attempt to answer it again. If the student decides that he doesn't know how to answer the problem, he can click on the "Show me hint" button and get the hints, one at a time, shown in Figure 16.

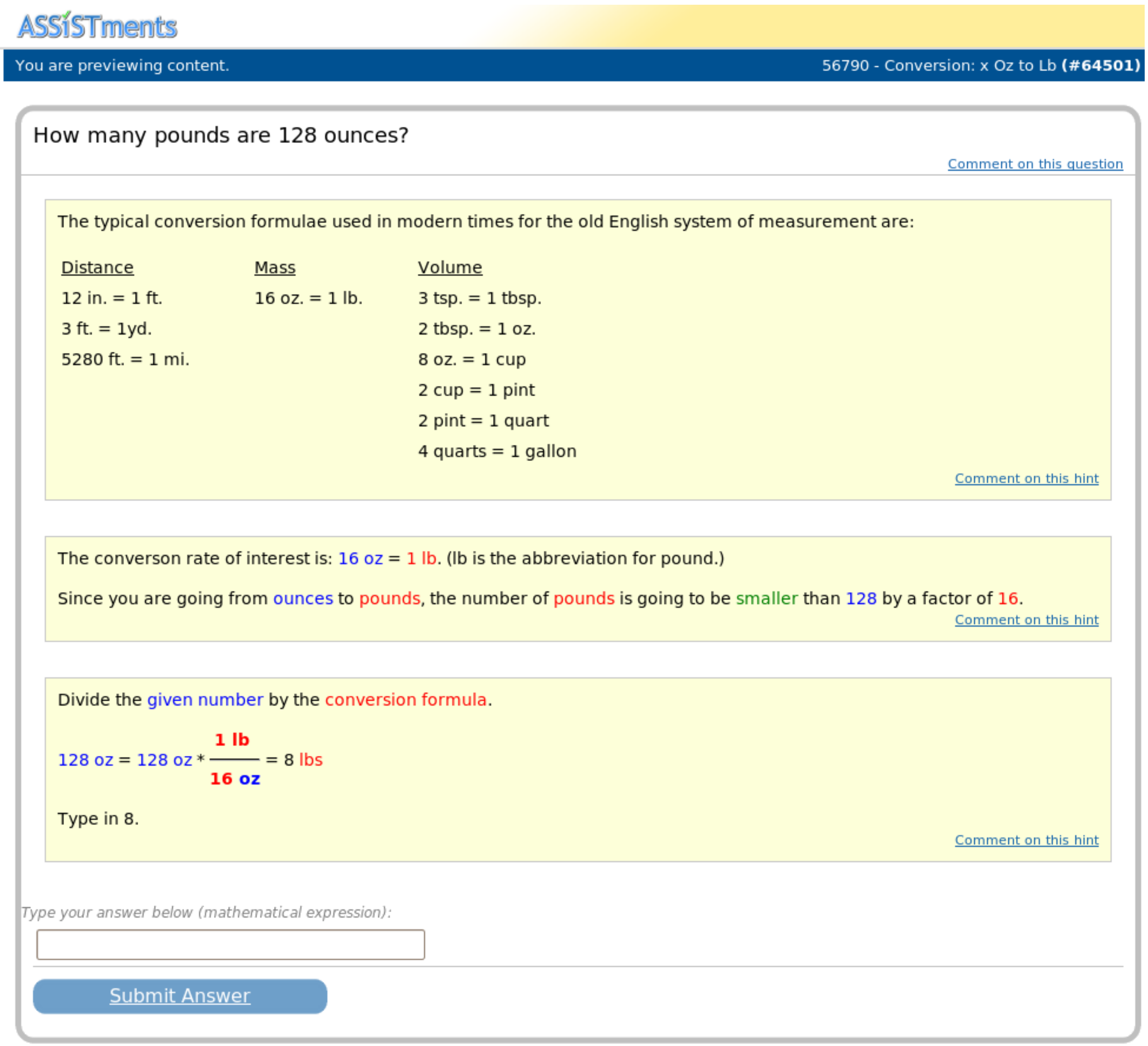


Figure 16: Sample Content - Hints ASSISTment No. 56790, ©2010 WPI

Once the hint button is clicked, the first hint is displayed. The first hint is the list of conversion factors for the conversion within a system problems. This way if a student forgets the formula, they will now have a better chance of correctly solving the problem. For conversion between systems, this first hint is skipped and the first hint becomes what the second hint is for the conversion within a system problems. The student can now either ask for another hint or attempt to answer the problem.

The second hint will then show how to use this formula, how to conceptualize the conversion in order to determine whether to multiply or divide by the conversion formula. The third hint shows how to do this, walking the student through step by step how to apply the conversion formula.

For the study, "Complete Explanation" ASSISTments were created based on the same template as the "Hints" ASSISTment. The "Complete Explanation" ASSISTment problem looks identical to the "Hints" version when it is assigned to the student. The student can either type an answer and click "Submit Answer" or click the "Break this problem into steps" button.

If the student either answers incorrectly, or asks for the problem to be broken into steps, a complete explanation is displayed as shown in Figure 17. This complete explanation is essentially the same as the 3 hints, but the student sees them all at once. In order to move to the next problem, the student must select the button that says "Ok. I have studied this example and am ready to get a new problem." In the complete explanation problem, the student never actually has to type the correct answer to get to the next problem. The student is also not able to guess at a problem more than one time.

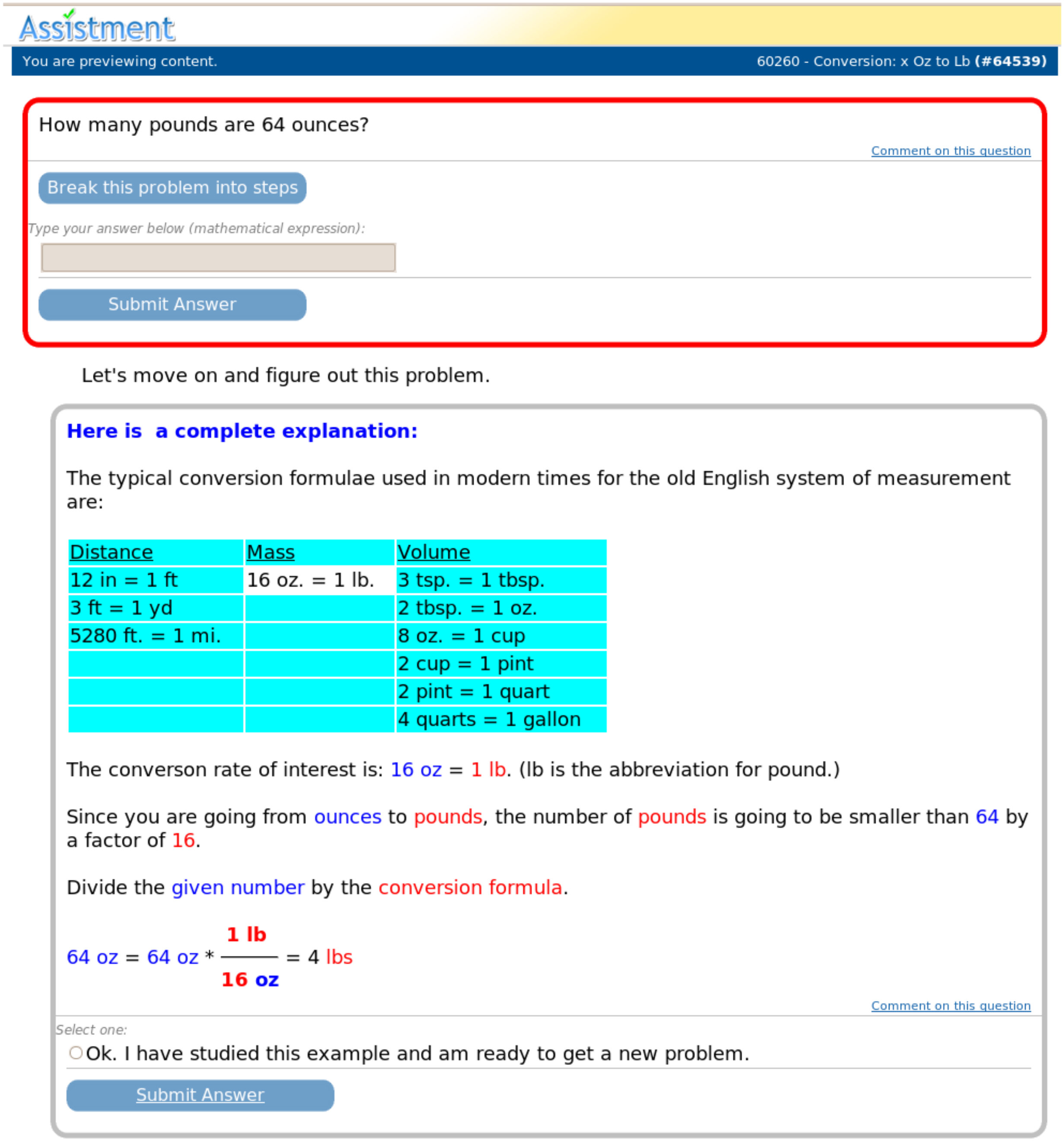


Figure 17: Sample Content - Complete Explanation ASSISTment No. 60260, ©2010 WPI

2.3.2 Area Problems - ASSISTment # 55910 / 62271 (Ruowang)

The following two ASSISTments are selected from skill set Area of Circle. Both ASSISTments solve the same problem of calculating the area of a circle; however, they use two different approaches called "Hints" and Complete Explanation". The Hints version of the

ASSISTments breaks down the problem step by step when the student fails to provide the correct answer or if the student clicks the "Show me hint" button. The Complete Explanation variation shows all the tutoring at once when the student enters the incorrect answer or click the "Break this problem into steps" button. First, a sample ASSISTments #55910, is shown in Figure 18. ASSISTments #55910 is Hint version of the problem of calculating area of the circle from radius.

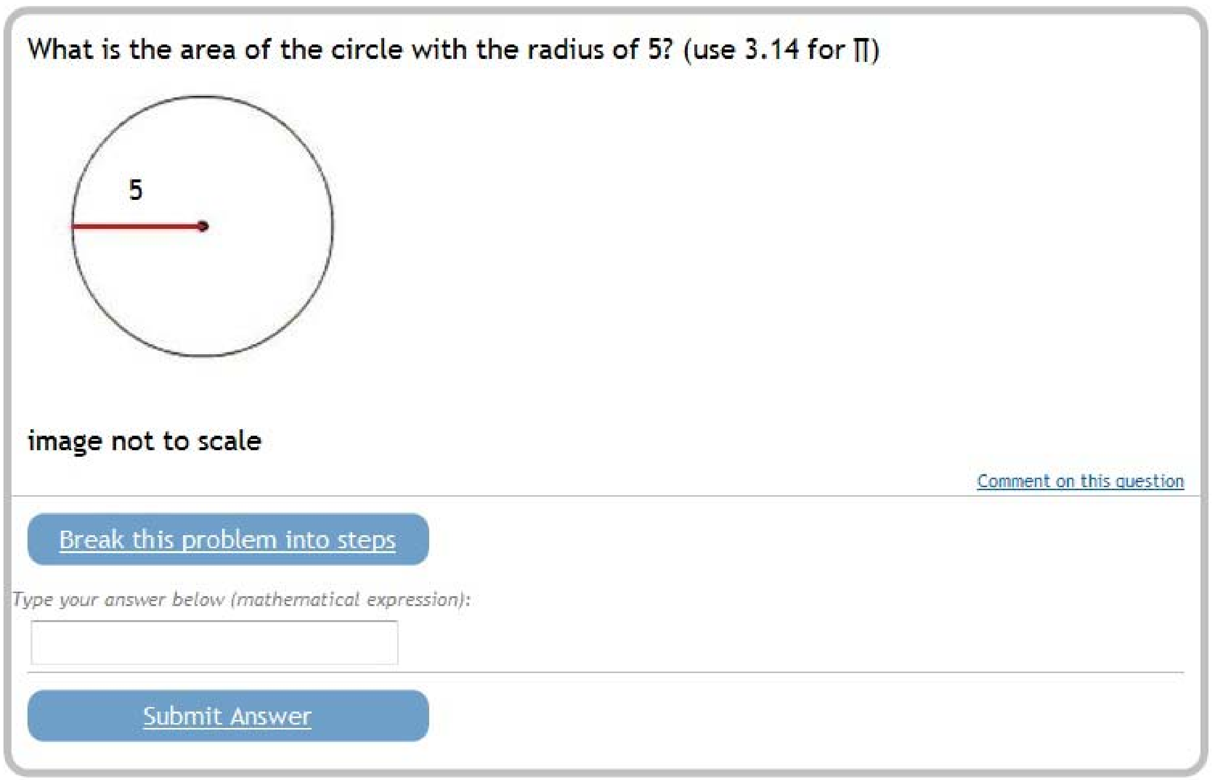


Figure 18: Sample Content - Hints ASSISTment No. 55910, ©2010 WPI

`	When a student enters an incorrect answer in the box, a scaffold quesion, which asks the formula to calculate the area of the circle, will appear. The answer choices include the correct formula and other variations that look similar to the correct formula. The student could choose one of the formulas and click submit or he can ask for hints for the question.

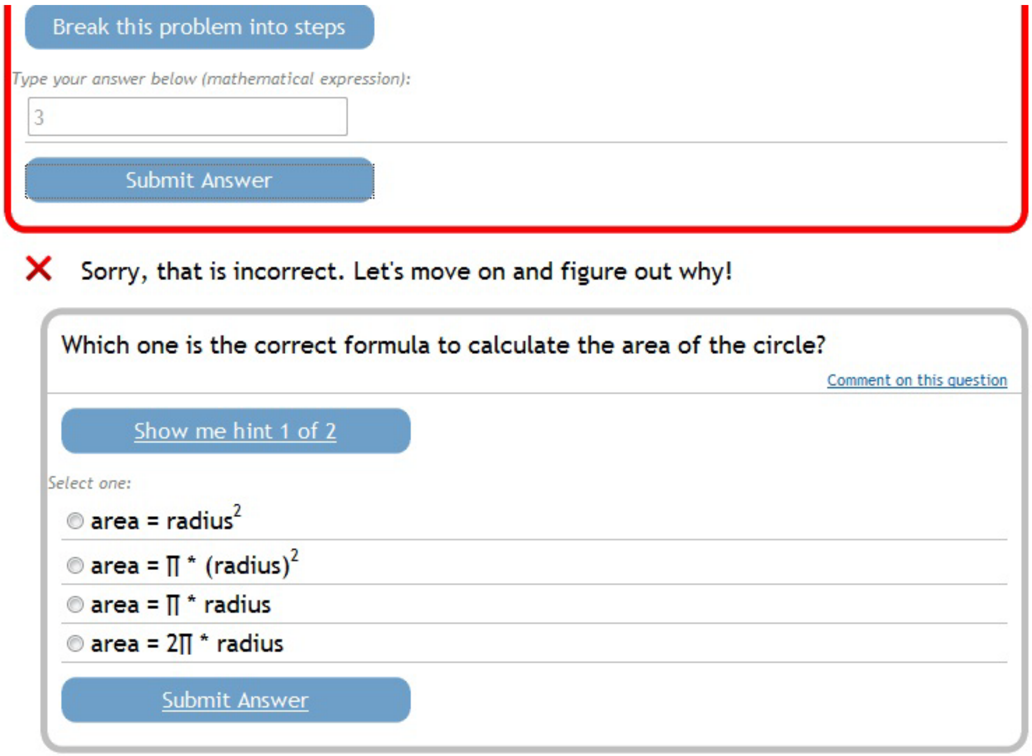


Figure 19: Sample Content – Scaffold for ASSISTment No. 55910, ©2010 WPI

The first hint shows the student the definition of the area of the circle. The animation is a great tool for the student to visually see what the area of the circle is. It also reminds the student the difference between the area and circumference.

Figure 20: Sample Content – Sample Content –Scaffold for ASSISTment No. 55910, ©2010 WPI

If the student is still unable to recall the formula for the area of circle, he can click on "Show me the last hint" and the correct formula will appear. The student can now choose the correct formula for the scaffold question.

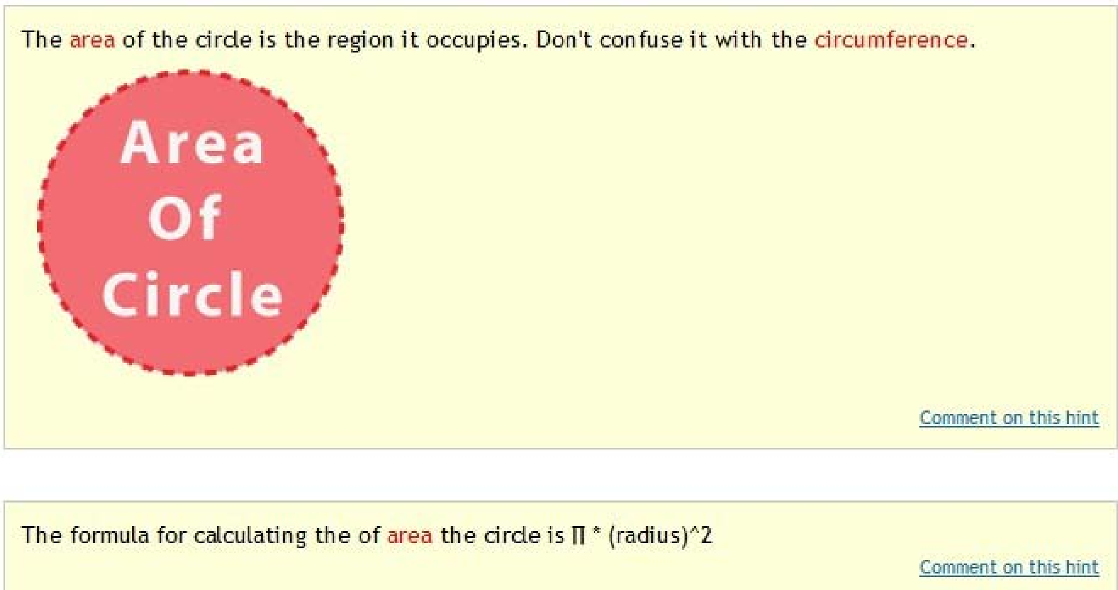


Figure 21: Sample Content –Scaffold for ASSISTment No. 55910, ©2010 WPI

After the student has successfully completed the scaffold question and understand the formula for the area of the circle, the student will be taken back to solve the original question to calculate the area of the circle.

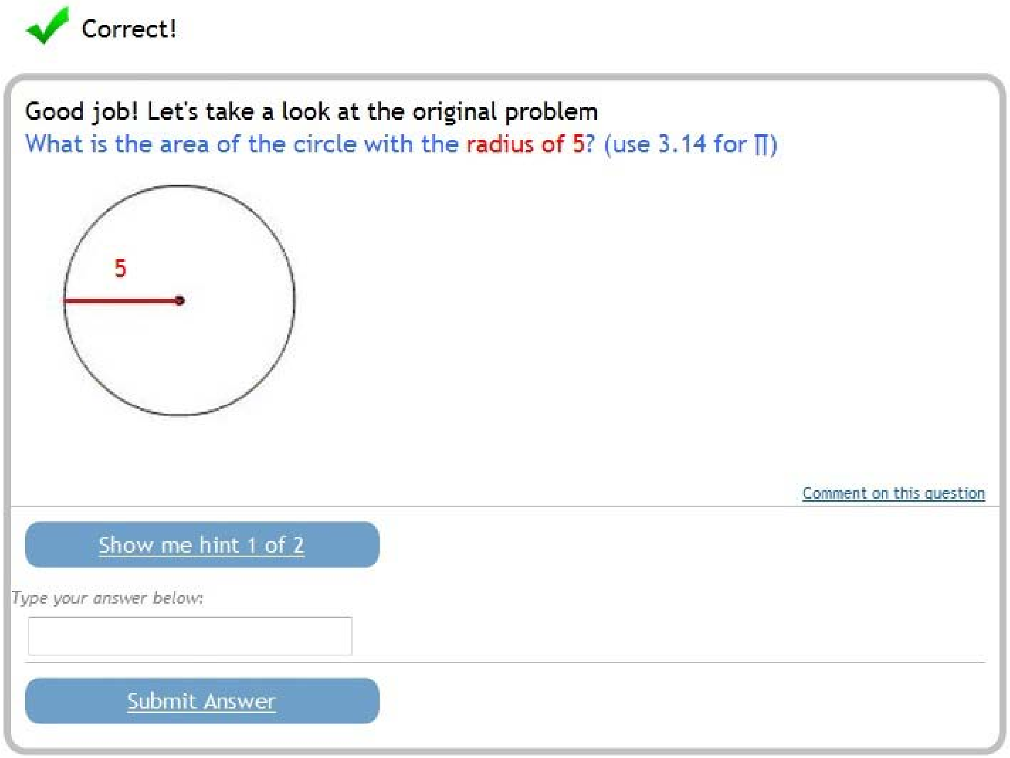


Figure 22: Sample Content –Repetition of Problem after Scaffold for ASSISTment No. 55910, ©2010 WPI

At this step, the student can try to calculate the correct answer using the knowledge gained from the scaffold question. But if the student is still unable to obtain the right answer, he or she can choose "Show me hint 1 of 2" option and the hint is displayed in Figure XX. This hint breaks down the actual steps for calculating the area of the circle by first listing the known variables, then the area formula, and lastly, the arithmetic computation.

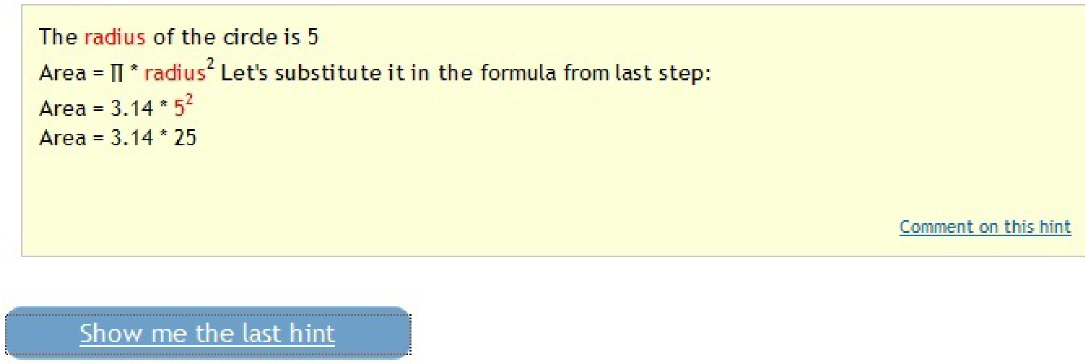


Figure 23: Sample Content – First Hint for ASSISTment No. 55910, ©2010 WPI

The last hint finishes the calculation in the previous hint and displays the actual number for the area of the circle.

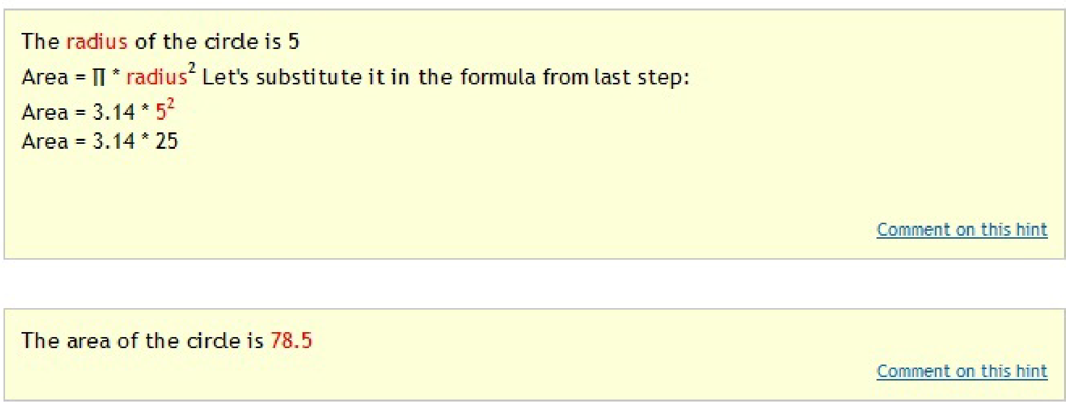


Figure 24: Sample Content – Second Hint for ASSISTment No. 55910, ©2010 WPI

Lastly, the student can enter the correct answer and move on to other ASSISTments. Once the correct answer is entered, a window similar to that shown in Figure 25 will be displayed.

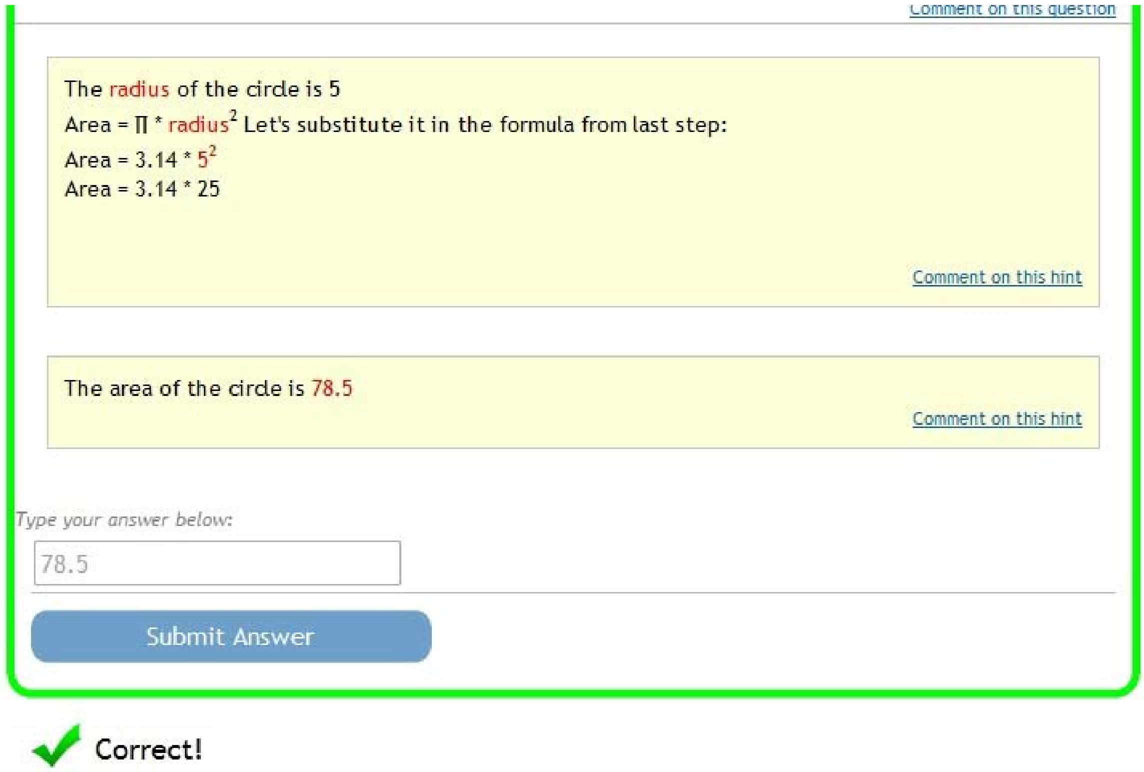


Figure 25: Sample Content – Correct Answer Message for ASSISTment No. 55910, ©2010 WPI

The "Complete Explanation" version of the ASSISTment has the same question and tutoring as the "Hints" version. The difference between the "Complete Explanation" and "Hints" ASSISTment is that the former shows the complete tutoring at once when the student enters the wrong answer or asks for tutoring, while the "Hints" version breaks down the tutoring in sections. The "Complete Explanation" ASSISTment of the area of circle is shown in Figure 16, the ASSISTment number is 62271.

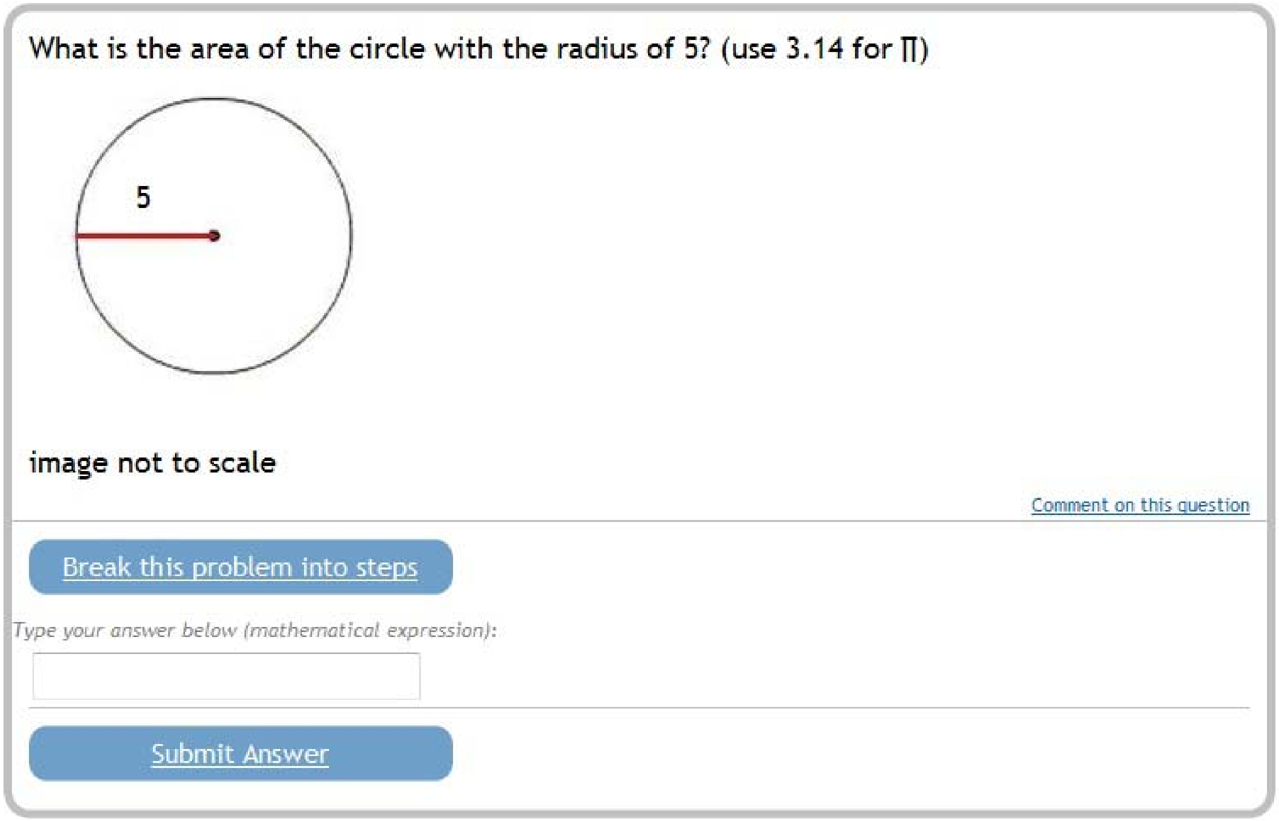


Figure 26: Sample Content – Complete Explanation ASSISTment No. 62271 , ©2010 WPI

The "Complete Explanation" question looks identical to the "Hint" version of the same problem. However, when the student clicks"Brake this problem into steps" or enters a wrong answer, the entire tutoring is shown immedietely in Figure XX. After the student has studied the tutoring, he or she will click on "Ok. I have studied this example and am ready to get a new problem", then the student will be directed to a new ASSISTment.

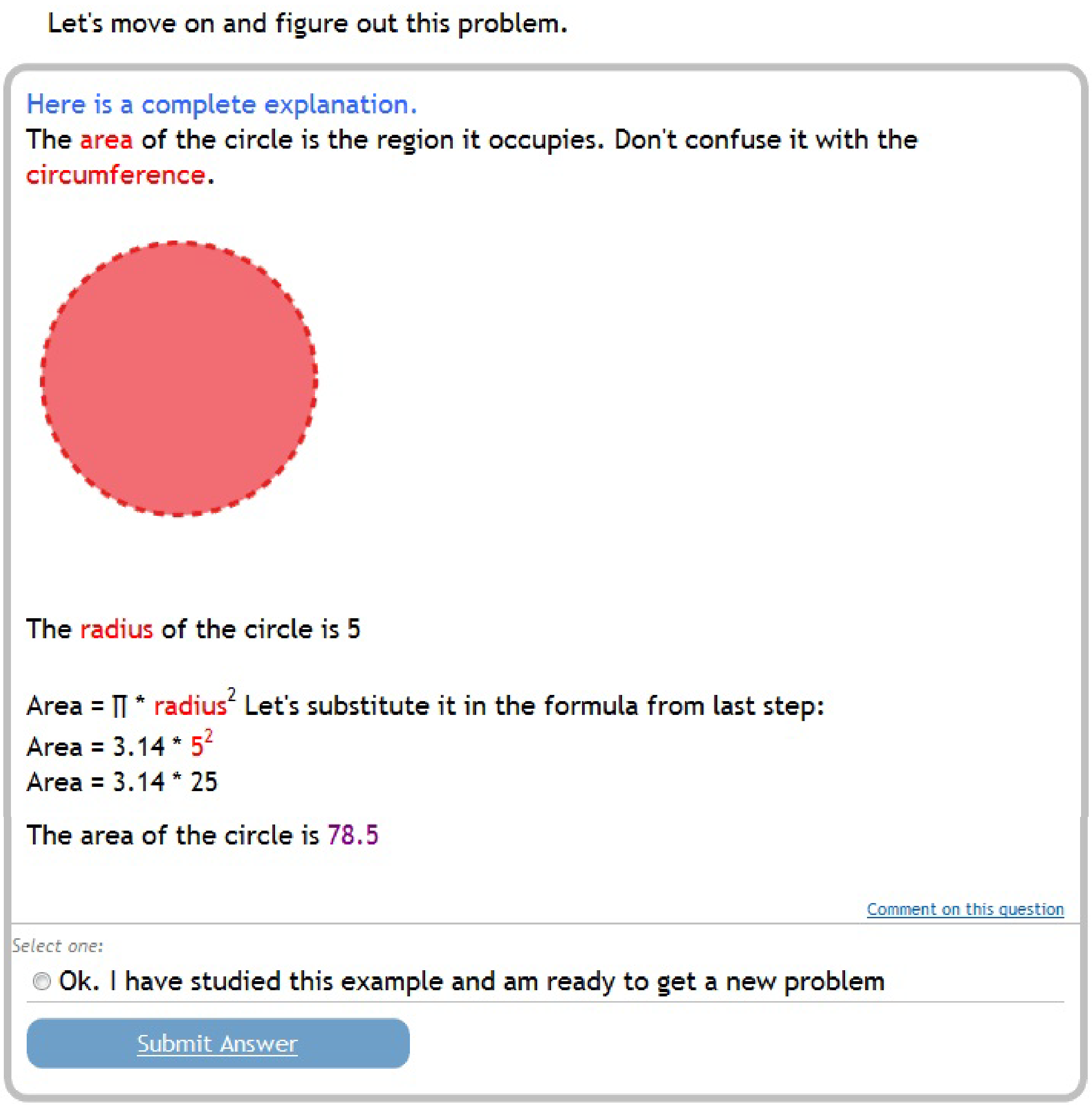


Figure 27: Sample Content – Complete Explanation ASSISTment No. 62271 , ©2010 WPI

2.3.3 Surface Area / Volume Problems - ASSISTment # 91256 / 68879 (Steve)

The following ASSISTment is an example of one of the Surface Area skills created by Steven Southard. Both the Hints and Complete Explanation versions will be shown. Hints vs. Complete Explanation tutoring, is the focus of our study, which will be described later in this paper. This ASSISTment shows how students are tutored with a particular skill. Figure 28 below shows what the student would see when they open a problem that was assigned to them. The student can type the answer in the box below and hit submit. If there answer is incorrect, a box displaying "No Sorry" will appear below the "Submit Answer" button. At this point the student can either guess again or ask for a hint by clicking "Show me hint 1 of 3".

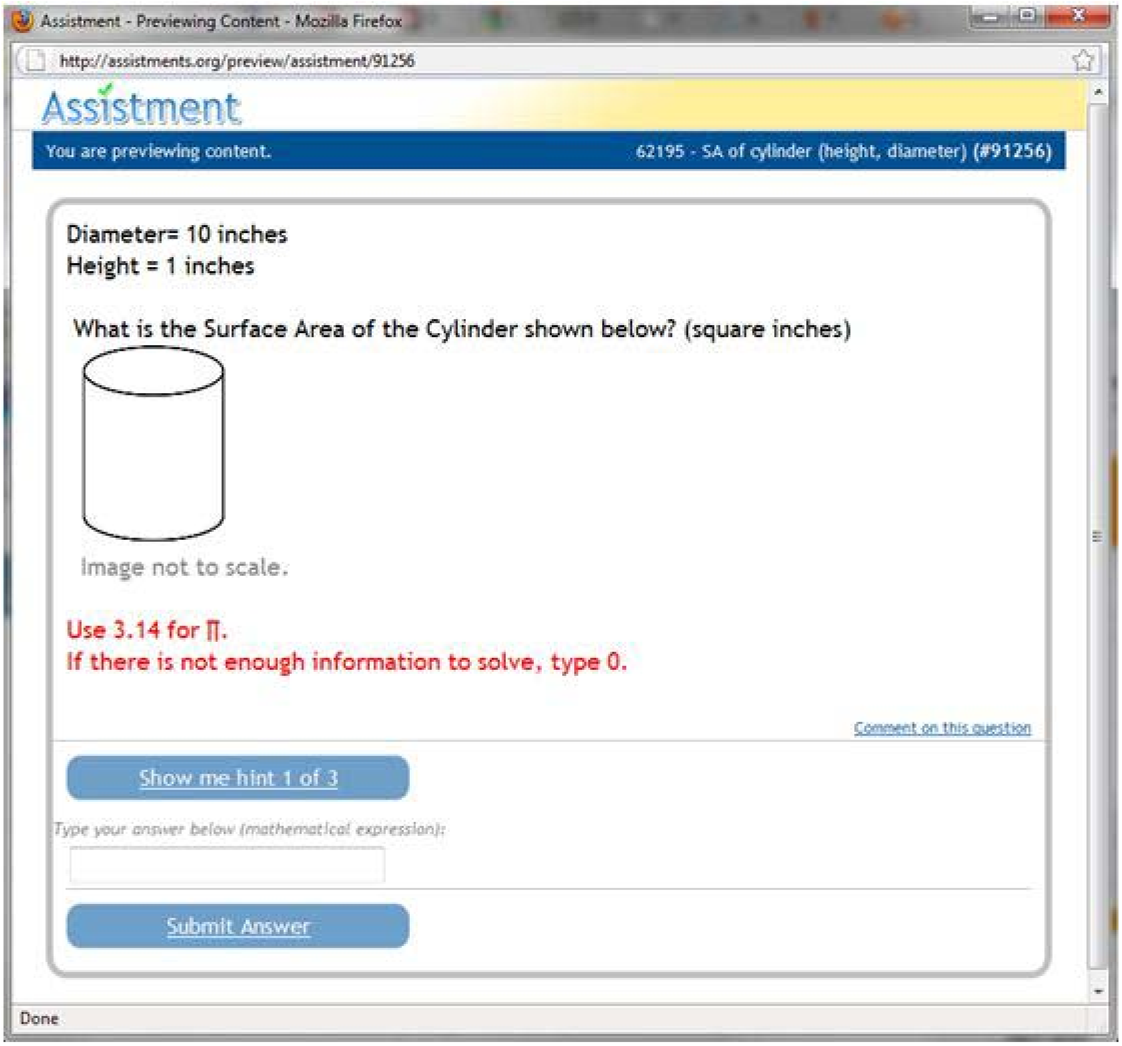


Figure 28: Sample Content – Hints ASSISTment No. 91256, ©2010 WPI

Once the hint button is clicked, the first hint is displayed. The first hint is generally very simple, typically the correct formula for the problem. This way if a student just mixed up the formula, they will now have a better chance of correctly solving the problem. The student can now either ask for another hint or attempt to answer the problem. A screenshot is shown below in Figure 29.

Figure 29: Sample Content – First Hint for ASSISTment No. 91256, ©2010 WPI

If after the first hint, the student still is unable to solve the problem, they can request a second hint as shown below in Figure 30. The second hint typically guides the student by breaking the problem down into simpler steps. Again the student can try to answer the question or request an additional hint.

Figure 30: Sample Content – Second Hint for ASSISTment No. 91256, ©2010 WPI

Now that the final hint has been requested, the remainder of the problem is worked out with all work shown. The student is able to see exactly how the problem can be solved. At the end the answer is written out with proper units, and then the exact numerical answer that needs to be entered into the box is shown at the bottom. The student cannot continue to the next problem until they type the correct answer in the box. Each "Hints" type ASSISTment will always show the exact answer in the last hint.

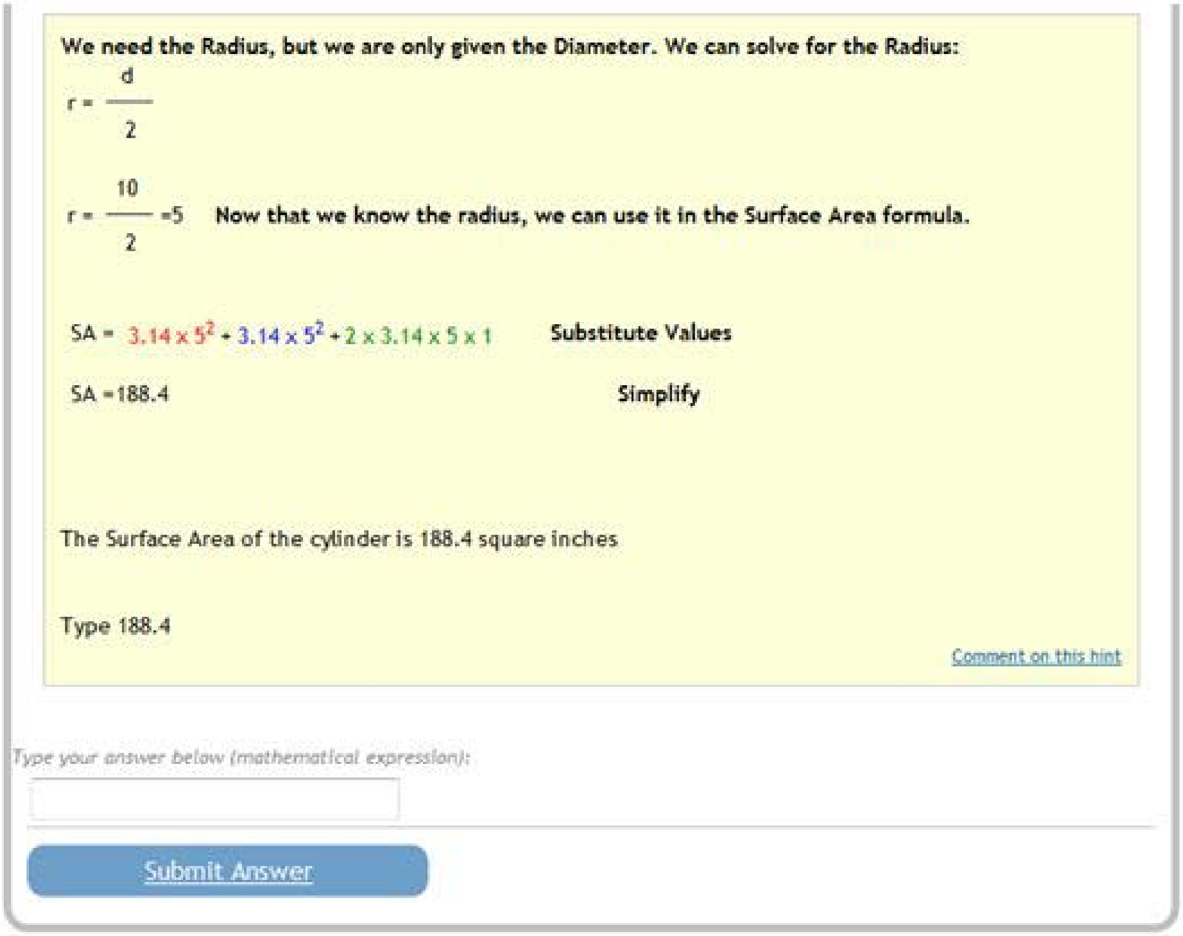


Figure 31: Sample Content –Final Hint for ASSISTment No. 91256, ©2010 WPI

For the study, "Complete Explanation" ASSISTments were created based on the same template as the "Hints" ASSISTment. The "Complete Explanation" ASSISTment problem looks identical to the "Hints" version when it is assigned to the student. The student can either type an answer and click "Submit Answer" or click the "Break this problem into steps" button as shown in Figure 32.

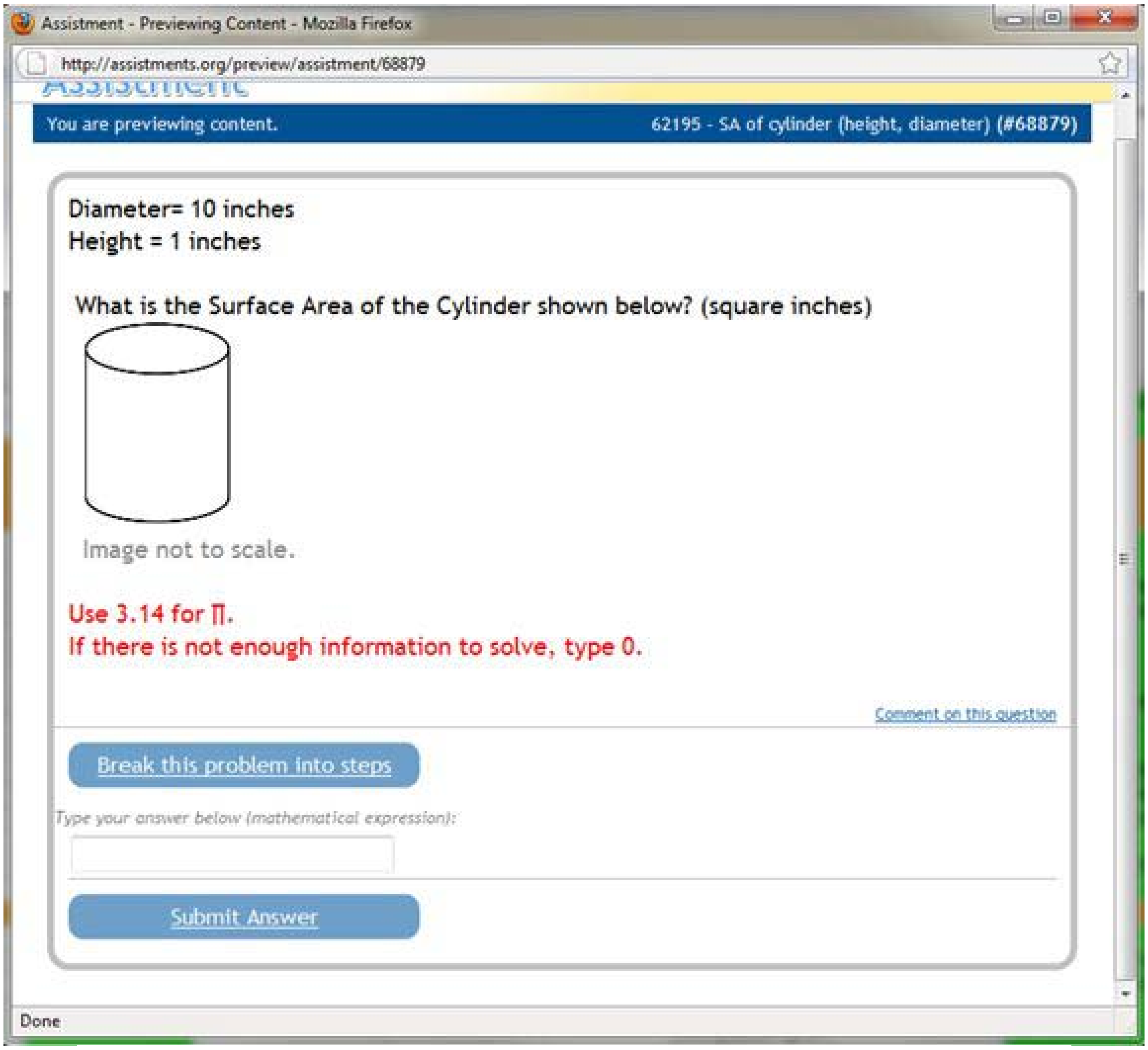
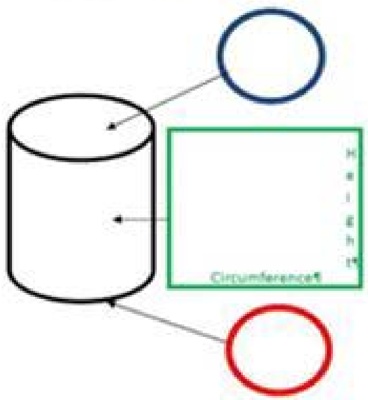


Figure 32: Sample Content –Complete Explanation ASSISTment No. 68879, ©2010 WPI

If the student either answers incorrectly, or asks for the problem to be broken into steps, a complete explanation is displayed as shown in Figure 33. This complete explanation is essentially the same as the 3 hints, but the student sees them all at once. In order to move to the next problem, the student must select the button that says "Ok. I have studied this example and am ready to get a new problem." In the complete explanation problem, the student never actually has to type the correct answer to get to the next problem. The student is also not able to guess at a problem more than one time.

Let's move on and figure out this problem.

$SA = A_{Base} + A_{Top} + A_{Side}$



$SA = Pi \times r^2 + Pi \times r^2 + 2 \times Pi \times r \times h$

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

We need the Radius, but we are only given the Diameter. We can solve for the Radius:

$$r = \frac{d}{2}$$

$$r = \frac{10}{2} = 5$$

Now that we know the radius, we can use it in the Surface Area formula.

$SA = 3.14 \times 5^2 + 3.14 \times 5^2 + 2 \times 3.14 \times 5 \times 1$ **Substitute Values**

$SA = 188.4$ **Simplify**

The Surface Area of the cylinder is 188.4 square inches

Comment on this question

Select one:

Ok. I have studied this example and am ready to get a new problem.

Submit Answer

Figure 33:Sample Content –Complete Explanation for ASSISTment No. 68879, ©2010 WPI

3 Experimental Design

3.1 Hypothesis

We believed that advanced students would show better learning from "Complete Explanation" tutoring in a shorter amount of time than they would from "Hints" tutoring. We also believed that less advanced students would learn more information from "Hints" tutoring than from "Complete Explanation" tutoring.

3.2 Method

3.2.1 Setup

To test the hypothesis, we created mastery learning problem sets, each template in the problem set had two copies, one that used hints, another in Complete Explanation, which displayed the same information, but in a single scaffold problem that would pop up if the student got the problem wrong. The scaffold problem would allow them to continue to the next problem if they tell the system that they have read the tutoring and are ready to try a new problem. Each problem set would be divided into two possible paths chosen by the computer at random when first starting the problem set. One path has problems created from the "Hint" templates and the other from the problems with the "Complete Explanation" template. Each of the two paths is a mastery learning problem set with either 3 or 5 problems required to master, 5 for the unit conversions, 3 for all others. For any particular student, the type of tutoring will remain the same until the student completes the problem set.

Our group focused on problems in the measurement category. Each of us worked on a group of similar skill sets within this category. This allowed each person to learn how to write and tutor their type of problems most effectively. For each category, each person determined what type of problems could be asked for each skill and developed a template for each one. The various skills were examined for both difficulty and differences in classification to determine the various levels created for each skill. For each level a different problem set was created, with the mastery problem set containing them all.

The problem sets were designed such that the computer would randomly assign, for each problem set, each student into one of two groups, either Complete Explanation or Hints. All actions performed by the student and random choices determined by the computer were then logged by the online system, allowing the teacher to view the student's performance on the problems and the experimenters to have accurate data on all the variables.

All the content was either created by us or came from previous ASSISTment problems.

3.2.2 Experimental Environment

The problem sets were given to many different classes, used by any teacher that decided to incorporate it into their lesson plan. We did not plan to obtain data from only specific schools with specific curricula; instead we wanted to obtain as broad a range of students as possible to use our problem sets. Students participating in our study were unaware that they were participating in a study, although the teachers did know. The only difference between our experiment and a normal Mastery Learning ASSISTment problem set is that, the two types of tutoring methods used were chosen randomly.

3.3 Recording Data

In order to obtain the necessary data for the experiment, a large amount of raw data was obtained from the ASSISTments grade book system. This data was then transferred into an Excel spreadsheet where it was filtered and organized using pivot tables. Calculated data was then added to this table to use for the analysis of the data.

For a consistent result, we have only used one teacher's class data, which included 90% of the overall data. 49 students attempted our problem sets, for a total of 551 attempts at solving a problem set we created during the duration of our study. For each such attempt, the values specified fields of information that would be required for our study were determined.

The following values were recorded to an Excel spreadsheet from the ASSISTment grade book:

- Row Number
- Student First Name
- Student Last Name
- Class Name
- Teacher Name
- School Name
- Start Time
- End Time
- User ID
- Assignment ID
- Sequence ID
- Problem Set Completed (Conditional)
- Condition Entered
- Total Mastery Seen
- Total Mastery Correct
- Time in Mastery

And for each problem done, the following were recorded:

- If that problem was correct
- How many hints were used

In addition, in preparation for the final analysis, the following fields were calculated:

- Outlier Status
- True Condition (Hints, Complete Explanation, No Condition)
- Percent Correct
- Student Average Percent Correct
- Standard Deviation of Percent Correct
- Percentile Category
- Problem Set Average Number of Problems to Master

- Problem Set Standard Deviation of Problems to Master
- Z-score of Number of Problems Taken to Master
- Problem Set Average Time to Master
- Problem Set Standard Deviation of Time to Master
- Z-score of Time to Master

And for each problem completed after the first, up to the average number of problems completed, the following was calculated:

- Gain on the problem from the previous problem

The first step in the analysis of the data was to determine what data can be used and what data can't. Students who mastered the problem set with no incorrect answers will never see any of the hints or complete explanation, making it impossible for data from these particular problems to be used for analysis. A "true condition" column was created using an if function in Microsoft Office Excel 2007 to determine if the student answered all questions correctly and then classified the true condition as hints, complete explanation, or no condition. Students in the no condition (all correct) group were not considered. Also, any incomplete data can't be used, so those students who have not yet mastered the problem set were not used.

Now we can take the remaining data points and filter by problem or student to calculate various averages, standard deviations, and z-scores. First, calculating each individual percent correct just involves dividing the number of problems correct by the total number of problems attempted. Using pivot tables, a student by student average and standard deviation of this information were easily calculated. The students can then be ordered by this calculated average to determine relative performance, which was used to determine the various percentile groups. This will later be used to separate high performers from low performers to determine if one type of tutoring strategy is better either overall, or for a particular group of students.

For problem set averages we immediately went into pivot tables and took out the data points we couldn't use. For both problems to master and time to master, we calculated the problem set average, the problem set standard deviation, and the z-score of each student. This information was then put back into the table for future use as well as being used or the determination of the outliers.

Next, to perform statistical analysis, the outliers in the data set must be removed. Our original motive for this is the recognition of obvious 'anomalies' in the data, specifically the students shown in Table 1. Having such data so far from the other data points will understandably skew the analysis. So our question is: Can we remove these points from our analysis? There is, in fact, a recognized method to determine the answer to this question. If there is less than a 5% chance for these points to occur in the calculated distribution, the points are outliers and can be removed. From the Mean Value Theorem, the distribution can be assumed to be Gaussian or normal, and for a normal distribution, 95% of the results are within 1.98 or ~2 standard deviations of the mean or average value. This means that we need to calculate the number of standard deviations each student is from the average value for each problem set. This number is called the z-score since it is commonly labeled by the letter z. Returning to the original question, the answer is: If the data point has a z-score of 2 or more when including that data point in the calculation of the average and standard deviation, it is safe to ignore; otherwise, we must keep that data point. We applied this statistical guideline to all the problem sets in our data. Table 2 shows the Problems to Master outliers; Table 3 shows the Time to Master outliers.

Table 1 Data points with number of problems to master obviously outside the expected range

Row	Student ID	Problem Set	No. Problems to Master
15	64525	8828	96
68	70702	8823	52
70	70702	8827	73

Table 2: Outliers for number of problems to master

Row	Student ID	Problem Set	Z-score	No. Problems to Master
15	64525	8828	2.78162864	96
68	70702	8823	3.105174807	52
70	70702	8827	2.578650487	73
138	70727	9044	2.148711411	15
215	70746	9403	2.605948442	31
334	73684	9405	2.498610343	22
379	73685	8820	2.211629342	15
449	75169	8830	2.54389568	17

Table 3: Outliers for time to master

Row	Student ID	Problem Set	Z-score	Time to Master
15	64525	8828	2.827272	4414.32
52	70702	8820	2.084843	796.7
156	70730	9491	2.036852	2148.14
246	70740	9403	2.333416	1842.56
248	70740	8825	2.155086	495.65
254	70740	9405	2.251844	1974.1
372	73685	9402	2.169741	2497.87
425	74678	8823	2.433487	1424.18
435	74698	9489	2.455668	2775.4

The remaining calculated values were the gains from one problem to the next. The question to answer is: Did the tutoring help the students learn? To answer this, we needed to look at how often a student, after getting tutoring, will then get the next question correct. To do this, we first needed to have a problem done before the problem examined for gain, so the gain can't be applied to the first problem done. Second, the student needed to have gotten tutoring on the previous problem, so if they got that correct, the gain can't be examined for that problem. The gain would then be whether or not the student got the problem in question correct, but applicable only if the previous problem was incorrect. This information was also added to the table for the future analysis.

3.4 Analysis

3.4.1 Tutoring strategy impact on number of problems to master

Pivot tables were used to search for trends in the data that showed tutoring strategy had an impact on the number of problems required to master. Various filters were used to limit the problem sets and students that were examined. A summary of this data is presented in Table 5 below. When all problem sets were included in the analysis, there were not any statistically reliable results, but there was an apparent trend. Overall, complete explanation tutoring resulted in 1 fewer problems required to master. When only the bottom 25% of students were considered in the analysis, hints tutoring resulted in 0.2 less problems on average, but when only the top 25% were considered, complete explanation tutoring resulted in 3.9 less problems to master, on average. This seems to be consistent with our hypothesis.

Next, analysis was performed to determine whether or not the problem set difficulty had an impact on which problem set type resulted in less attempts. When problems with an average of less than 60% were considered, students took an average of 3.7 less problems to master using complete explanation problems compared to hints problems. When problem sets with an average greater than 85% were considered, hints tutoring actually required 1.5 less problems to master than complete explanations. The analysis of the problem sets with an average greater than 85%

was statistically reliable with a two-tailed T-test value of 0.010323. The results of this analysis are summarized in Table 4.

Table 4: strategy effect on number to master for problems with an average > 85%

Sequence ID	Number to Master		Additional Hints Required	Least Attempts Required
	C.E.	Hints		
8785	9	7	2	Hints
8820	8	7	1	Hints
8823	10	8	2	Hints
8824	9	7	2	Hints
9403	7	7	0	N/A
9488	10	9	1	Hints
Grand Total	9	7.5	1.5	Hints

Table 5: Summary of Analysis of Tutoring Strategy Impact on Number to Master

Problem Sets Included	Students Included	Complete Explanation		Hints		Comparison		
		Avg Number Required	Count Lowest No. Req'd	Avg Number Required	Count Lowest No. Req'd	Least Attempts	Attempts Saved C.E.'s	Reliable
All	All	8.2	15	9.1	17	C.E.	0.8	NO
All	Bottom 25%	9.8	4	9.6	8	Hints	-0.2	NO
All	Bottom 50%	7.9	14	9.8	12	C.E.	1.9	NO
All	Top 50%	8.0	7	9.0	6	C.E.	1.0	NO
All	Top 25%	7.0	3	9.9	2	C.E.	2.9	NO
> 85%	All	9.0	0.5	7.5	5.5	Hints	-1.5	Yes -0.010323
> 80%	All	7.9	3	7.3	13	Hints	-0.6	Count (0.0073)
< 80%	All	8.3	15	10.0	10	C.E.	1.6	NO
< 70%	All	9.7	9	12.7	7	C.E.	2.95	NO
< 60%	All	10.1	8	13.8	3	C.E.	3.7	NO

3.4.2 Impact of tutoring on problems for different skills

In order to determine if the type of problem (Unit Conversion vs. Area/Volume) has an impact on whether one tutoring style is more effective than another, the average number of attempts to master was examined for both Unit Conversion skills and Area/Volume skills. Table 6 shows a summary of the results when all unit conversion problem sets that had completed attempts in each condition were examined. The data below is a compilation of data from 21 students who completed 10 unique problem sets. Because each student did not complete every problem set, only a total of 34 Complete Explanation problems and 49 Hints problems were completed. This data clearly shows that students take less time to master Complete Explanation problem sets compared to Hints problem sets. Seven out of the ten problem sets were mastered in a fewer number of attempts with Complete Explanation tutoring when compared to Hints. The average number of attempts for Complete Explanation problem sets is 7.56, while the average number to master for Hints problems is 10.94. This resulted in an average of 3.38 additional Hints problems to master. This difference in average number of attempts to master is statistically reliable based on a two-tailed T-test value of 0.022561, which is below the required 0.05 to be reliable. The additional required problems to master resulted in an average of 26.3 seconds more time to master.

Table 6: Tutoring strategy impact on time to master unit conversion problems

Problem Set ID	Average Number to Master		Fastest Tutoring	Less Problems Required	
	C.E	Hint		CE	Hints
8785	8.75	8.60	Hints	0	1
8820	7.33	7.60	C.E.	1	0
8822	7.00	6.00	Hints	0	1
8823	8.00	15.00	C.E.	1	0
8824	10.00	9.60	Hints	0	1
8825	5.00	9.33	C.E.	1	0
8827	10.67	19.67	C.E.	1	0
8828	6.50	11.40	C.E.	1	0
8829	5.75	10.00	C.E.	1	0
8830	6.40	8.00	C.E.	1	0
Grand Total	**7.56**	**10.94**	**C.E.**	**7**	**3**

Table 7 shows a summary of the results when all area/volume problem sets that had completed attempts in each condition were examined. The data below is a compilation of data from 16 students who completed 18 unique problem sets. Because each student did not complete every problem set, only a total of 47 Complete Explanation problems and 55 Hints problems were completed. Students took less time to master Hints problem sets compared to Complete Explanation problem sets. 14 out of the 18 problem sets were mastered in a fewer number of attempts with Hints tutoring when compared to Complete Explanation. This difference is statically reliable based on the two-tailed T-test value of 0.013529 and a two tailed binomial calculation resulting in a p-value of 0.031. The average number of attempts for Complete Explanation problem sets is 8.74, while the average number to master for Hints problems is 8.20. This results in an average of 0.54 additional Complete Explanation problems to master. The additional required problems to master resulted in an average of 40.5 more seconds to master for Complete Explanation problem sets.

On average, Unit conversion problems required less Complete Explanation problems than Hints to master, while area/volume problems required a larger number of Hints problems to master when compared to Complete Explanations. This may be due to the fact that in area/volume problems students were most likely commonly challenged by forgetting formulas, so looking at a quick hint may be more effective than looking at a complete explanation, which may add undue confusion if the only reason that the student answered incorrectly was because they forgot the formula. In contrast, unit conversion is a tricky skill, which is hard to convey in a quick hint. Students may get more benefit from reading the answer to an entirely solved problem, rather than getting single hints.

Table 7: Tutoring strategy impact on time to master area/volume problems

Problem Set ID	Average Number of Attempts		Fastest Tutoring	Less Problems Required	
	C.E.	Hints		CE	Hints
9081	25.00	14.00	Hints	0	1
9091	7.50	7.00	Hints	0	1
9092	7.00	7.00	Hints	0	1
9095	6.00	5.33	Hints	0	1
9100	7.50	7.25	Hints	0	1
9101	6.67	8.00	C.E.	1	0
9283	5.00	4.50	Hints	0	1
9401	8.50	20.50	C.E.	1	0
9402	7.33	7.33	Hints	0	1
9403	5.67	12.43	C.E.	1	0
9404	12.00	8.00	Hints	0	1
9405	10.67	7.00	Hints	0	1
9472	8.75	6.00	Hints	0	1
9487	9.33	7.75	Hints	0	1
9488	9.33	6.33	Hints	0	1
9489	11.00	8.60	Hints	0	1
9490	11.00	3.67	Hints	0	1
9491	5.00	8.67	C.E.	1	0
Grand Total	**8.74**	**8.20**	**Hints**	**4**	**14**

3.4.3 Impact of tutoring on students of different averages

An analysis of the data shows that while higher performing students are better with complete explanation and lower performing students are better with hints, as expected, the difference is not statistically significant. The exception appears to be the third quartet, students in the 50% to 75% percentile. For these students, complete explanation was faster. Above somewhere around 75% and 80%, the difference appears to disappear. However, we cannot say that those students have no differences, only that we can't be 95% certain that there is a difference. The results are shown in Table 8.

The deciles were calculated for the purpose of showing this information graphically to determine if there is a trend. There was not expected to be enough data to get a significant result. As Figure 34 shows, the trend appears to be down, but the uncertainty is too great to guarantee this.

Table 8: Problems to Master based on Quartile, Median, and 10% Splits of Students

Quartile	Chance for Shared Mean (T-Test)	Relative Difference((CE Ave – Hint Ave) /Tot Ave)	Standard Deviation per Average Questions to Master	Relative Difference + Standard Deviation	Relative Difference – Standard Deviation
0 - 25	0.946	0.059			
25 - 50	0.727	0.106			
50 - 75	0.029	-0.090			
75 - 100	0.271	-0.013			
Median	**T-Test**	**Ave Diff.**	**STD**	**Max Diff.**	**Min Diff.**
0 - 50	0.479				
50 - 100	0.792				
Percentile	**T-Test**	**Ave Diff.**	**STD**	**Max Diff.**	**Min Diff.**
0 - 10	0.159	0.307	0.565	0.871	-0.258
10 - 20	0.235	-0.283	0.602	0.319	-0.885
20 - 30	0.610	0.072	0.432	0.504	-0.361
30 - 40	0.228	0.393	0.518	0.911	-0.125
40 - 50	0.854	-0.024	0.277	0.253	-0.302
50 - 60	0.757	-0.077	0.411	0.334	-0.488
60 - 70	0.619	-0.092	0.386	0.294	-0.478
70 - 80	0.472	0.140	0.451	0.591	-0.312
80 - 90	0.238	-0.598	0.702	0.104	-1.300
90 - 100	0.558	0.379	0.715	1.094	-0.336

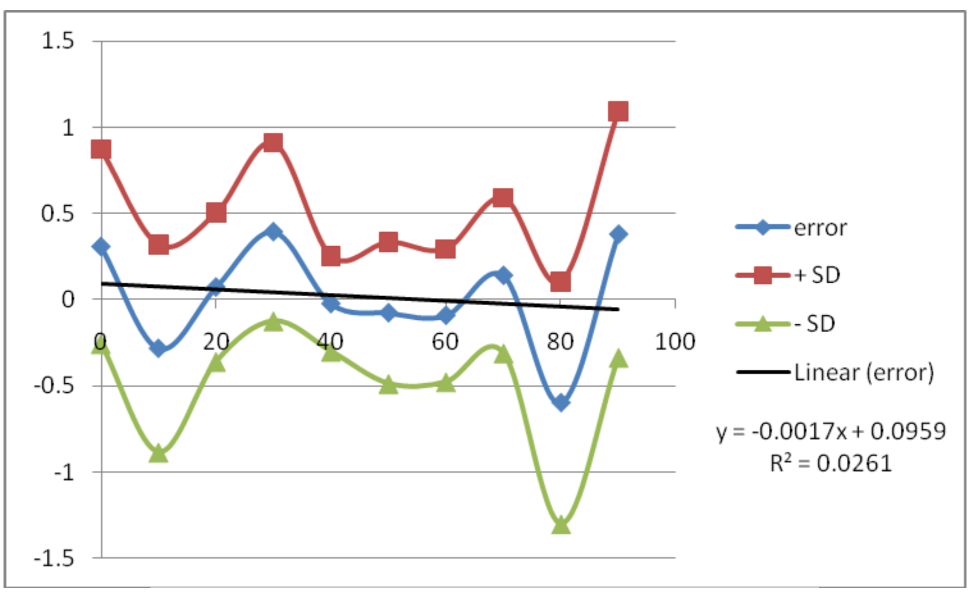


Figure 34: Plot of Relative Difference vs. Students in decile

3.4.4 Tutoring Strategy Impact on Learning Based on Gain

In order to determine which type of tutoring students learn better from, a scientific method to classify learning was established. We have defined learning to occur when a student answers a problem correctly immediately after answering a question incorrectly. For this study we will call this "gain". If a student answered a question incorrectly, followed by another incorrect attempt, this will be called "no gain" In order to determine the %learning, the following formula will be used:

$$\%\ Learning = \frac{Gain}{Gain + No\ Gain} * 100\%$$

Once we have the % learning value, we can compare the two tutoring strategies to determine which strategy is more effective. Table 9 shows a summary of all analysis performed on the data set and includes a comparison of the two tutoring strategies effect on learning. Different analyses were performed by varying the students included in the data and isolating certain types of problem sets. For the entire data set, Complete Explanation problems resulted in a 3.83% increase in learning over Hints problems. This result did not have a statistically reliable difference.

Next only Area/Volume problems were considered, and a 6.63% increase in learning was shown for Complete Explanation problems when compared to hints. However, for Unit Conversion skills, Hints showed a minimal 0.11% increase in learning over complete explanation problems. Neither of these results can be classified as statistically valid by using a T-test, but there does appear to be some trends in the data.

Table 9: Summary of Analysis of Tutoring Strategy Impact on Learning

Students Included	Problems Included	Complete Explanation			Hints			Comparison				
		Average Gain	Average No Gain	% Learning	Average Gain	Average No Gain	% Learning	Highest % Learning	Increased %Learning for C.E.'s	Count of Highest % Learning: CE	Count of Highest % Learning: Hints	Statistically Reliable
All	All	1.49	3.58	29.38	1.39	4.06	25.56	C.E.	3.83	17.0	11.0	No
All	Area/Vol	1.65	3.54	31.80	1.37	4.07	25.17	C.E.	6.63	11.0	7.0	No
All	Units	1.26	3.62	25.90	1.42	4.04	26.02	Hints	-0.11	6.0	4.0	No
All	**> 85%**	**1.00**	**1.00**	**50.00**	**1.00**	**2.50**	**28.57**	**C.E.**	**21.43**	**5.5**	**0.5**	**Yes**
All	> 80%	1.15	2.44	31.96	1.15	2.89	28.44	C.E.	3.52	9.5	6.5	No
All	< 80%	1.61	4.33	27.15	1.68	3.97	29.71	Hints	-2.57	8.0	17.0	No
All	< 75%	1.68	4.49	27.27	1.69	4.29	28.33	Hints	-1.05	10.0	13.0	No
All	< 70%	1.74	4.56	27.65	1.74	4.26	28.99	Hints	-1.34	10.0	6.0	No
All	< 65%	1.74	4.56	27.65	1.74	4.26	28.99	Hints	-1.34	10.0	6.0	No
Lowest 25%	All	1.77	2.85	38.33	1.78	3.94	31.07	C.E.	7.27	7.0	5.0	No
Lowest 50%	All	1.43	3.78	27.44	1.38	4.21	24.69	C.E.	2.75	12.0	14.0	No
Highest 50%	All	1.44	3.31	30.26	1.25	4.04	23.62	C.E.	6.64	6.0	6.0	No
Highest 25%	All	1.40	3.00	31.82	1.30	4.80	21.31	C.E.	10.51	3.0	2.0	No

For the next analysis, problem sets were eliminated based on the overall average of each problem set. By using the overall problem set average, we are able to see if a particular tutoring strategy worked better on easier problem sets (higher overall average) compared to harder problem sets (lower overall average). This data clearly shows a trend that learning was accomplished slightly more effectively with Hints problems than it was with Complete Explanation problems for harder problems. Complete Explanation problems clearly yielded the best learning for the easiest problems. A statistically reliable difference was found in learning percent for problems with an overall average of 85% or greater. Table 10 shows the data that was used for the following analysis and determination of a statistically reliable difference. The data below is a compilation of data from 10 students who completed 6 unique problem sets. Because each student did not complete every problem set, only a total of 7 Complete Explanation problems and 6 Hints problems were completed. 5 out of 6 problem sets had a higher learning percentage when Complete Explanation tutoring was utilized. 1 out of the 6 problem sets had an identical learning percentage, and none of the easiest 6 problems had a higher learning percentage for hints. The average percent learning for Complete Explanation problems was 50%, compared to 28.57% for Hints problems. This difference is statistically reliable based on a T-Test value of 0.03616.

Table 10: Effect of Tutoring Strategy on Learning for Problem Sets with an Average > 85%

Problem Set ID	Complete Explanation				Hints				Comparison
	Average Count of		Percent Learning		Average Count of		Percent Learning		Highest % Learning
	Gain	No Gain	Value (%)	Count	Gain	No Gain	Value (%)	Count	
8785	1	1	50.00	1	1	3	25.00	0	C.E.
8820	1	2	33.33	1	1	3	25.00	0	C.E.
8823	1	0	100.00	1	1	2	33.33	0	C.E.
8824	1	1	50.00	1	1	3	25.00	0	C.E.
9403	1	3	25.00	0.5	1	3	25.00	0.5	Hints
9488	1	0	100.00	1	1	1	50.00	0	C.E.
Grand Totals	**1**	**1**	**50**	**5.5**	**1**	**2.5**	**28.57**	**0.5**	**C.E.**

The final analysis summarized in Table 9 was to see if students of different abilities were able to learn better from one tutoring strategy. The results are statistically inconclusive, but seem to point to the trend that students with higher overall averages see a greater increase in learning from Complete Explanations than do students with lower averages. It was surprising that the students with the lowest averages still had better learning on complete explanation problems than hints problems.

3.4.5 Tutoring strategy impact on time to master

Pivot tables were used to search for trends in the data that showed that tutoring strategy had an impact on the time required to master. Various filters were used to limit the problem sets and students that were examined. A summary of this data is presented in Table 11 below. When all problem sets were included there were not any reliable trends, and there seems to be very little difference in time between hints and complete explanation tutoring. Also, when students of different abilities were separated, there were still no readily apparent trends. Next, time to master trends were analyzed by looking at sets of problems with varying difficulties. Again, the results were inconclusive, so it does not appear that tutoring strategy has profound effect on time to master in easier or harder problems.

Next, the problems were separated into two problem types: Unit Conversion (Units) and Area/Volume skills. When all unit conversion problems were included in the data set, complete explanation tutoring problems took an average of 26.3 seconds longer than hints tutoring problems. Out of the ten unit conversion problem sets, eight were finished faster using complete explanation tutoring. This difference is statistically reliable, with a two-tailed T-test value of 0.05. For these problems, it appears to be the trend that the lower the students average the greater the time difference is between hints and complete explanations. For area and volume skills, while there is no statistically reliable difference between the average time to master for hints or complete explanation tutoring, there is an apparent trend that the bottom half of students are able to master faster using complete explanations, while the top half of students are able to master considerably faster using hints tutoring. This could be due to the fact that the better students only required one hint in order to solve the problem, while the students with lower averages required more hints. Also, the students with lower averages might have guessed again after receiving one hint and again got the problem incorrect, which would result in increased time when using hints.

Table 11: Summary of Analysis of Tutoring Strategy Impact on Time to Master

Problem Sets Included	Students Included	Complete Explanation		Hints		Comparison		
		Avg Time	Count Fastest	Avg Time	Count Fastest	Fastest Tutoring	Time Saved C.E.'s	Reliable
All	All	348.4	18	326.1	14	Hints	-22.3	No
All	Bottom 25%	479.7	4	611.0	8	C.E.	131.3	No
All	Bottom 50%	354.8	13	398.6	13	C.E.	43.7	No
All	Top 50%	250.9	6	221.0	7	Hints	-29.9	No
All	Top 25%	224.3	3	274.1	2	C.E.	49.8	No
> 85%	All	210.8	3	148.6	3	Hints	-62.2	No
> 80%	All	186.9	7	158.9	9	C.E.	172.9	No
< 80%	All	418.1	13	390.7	12	Hints	-27.5	No
< 70%	All	553.3	5	635.7	11	C.E.	591.3	No
< 60%	All	634.8	4	641.6	7	C.E.	6.8	No
Units	**All**	**253.2**	**8**	**279.4**	**2**	**C.E.**	**26.3**	**Yes - .05**
Units	Bottom 50%	270.9	5	352.1	4	C.E.	81.2	No
Units	Top 50%	241.7	3	238.5	4	Hints	-3.2	No
Area/Vol	All	417.3	6	377.8	12	Hints	-39.4	No
Area/Vol	Bottom 50%	404.6	8	424.1	9	C.E.	19.5	No
Area/Vol	Top 50%	267.9	3	181.6	3	Hints	-86.3	No

In order to determine if the type of tutoring (Complete Explanations vs. Hints) has an impact on the time for the students to complete the problem set, the average time and individual time were examined for both Complete Explanation and Hints problem set. The analysis included the separation of student into top and bottom groups, as well as quartiles. Table 12 shows a summary of the results of the average time and p-value for each condition. The initial data was filtered so that the outlier students with exceeding amount of time or attempts were excluded. The revised data included 11 students in top half percentile, 9 students in the bottom percentile, 5 students in the 1st quartile, 7 students in the 2nd quartile, 5 students in the 3rd quartile, and 5 students in the 4th quartile. The data shows that in all ranks of the student, Hints problem set require more time than Complete Explanation problem set. The average time differences between the Complete Explanation and Hint problem set are normally in the range of 200 seconds. The same data is graphed in Figure 35. T test was used to compare the difference of time between the students in the same ranking. The p-values obtained for each comparison did not indicate any significant difference between the groups. However, the insignificant p-value could due to the limited sample size. According to Figure 35, the average time for hint problems was always higher than the complete explanations. The repetitive pattern could in some degree compensate the poor p-value. Thus, the conclusion from this analysis is those Hint problems require more time to complete than Complete Explanations.

Table 12: Impact of tutoring strategy on completion time

Tutoring Strategy	**Top half average time (s)**	**Bottom half average time (s)**	**1st quartile average time (s)**	**2nd quartile average time (s)**	**3rd quartile average time (s)**	**4th quartile average time (s)**
Complete Explanation	1210.749	2009.065	2428.838	1709.227	1143.784	1277.714
Hints	1377.411	2269.8225	2957.5	1778.6243	1332.904	1421.918
p-value	0.203028	0.691449	0.730423	0.902969	0.294475	0.517855

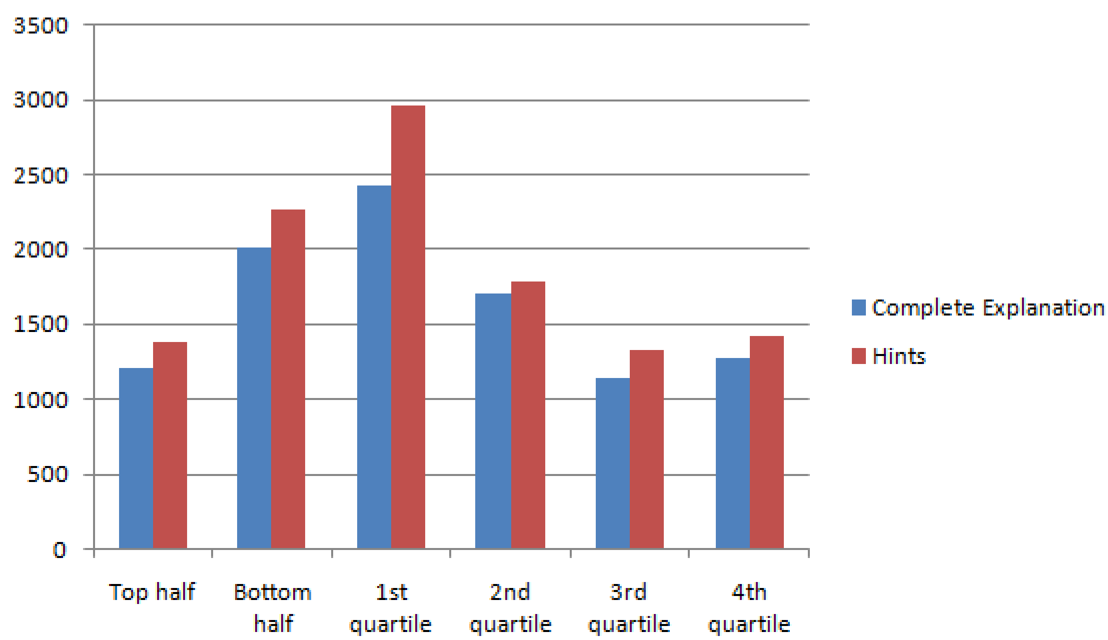


Figure 35:Impact of tutoring strategy on completion time

3.4.6 Number of problems to master compared to student average

In order to determine how well the students performed, one question we asked is: what is the correspondence of number of problems to master compared to the student average on the problems? The reasoning for this being that both of these could be considered as a measurement of performance for a mastery learning problem set. The hypothesis was that these were measuring the same thing, and would therefore be strongly correlated. If a student has a high percentage correct and a high number done, the student would be continuously getting a problem incorrect after 3 or 4 correct problems. If we think oddities like this are rare, considering that getting a certain number correct in a row will allow mastery, there should be a correlation between these two quantities.

After taking out outliers and incomplete data, Figure 36 showsremaining data. The zeros are probably data incorrectly marked as finished when they were not finished. The data here shows little correlation.

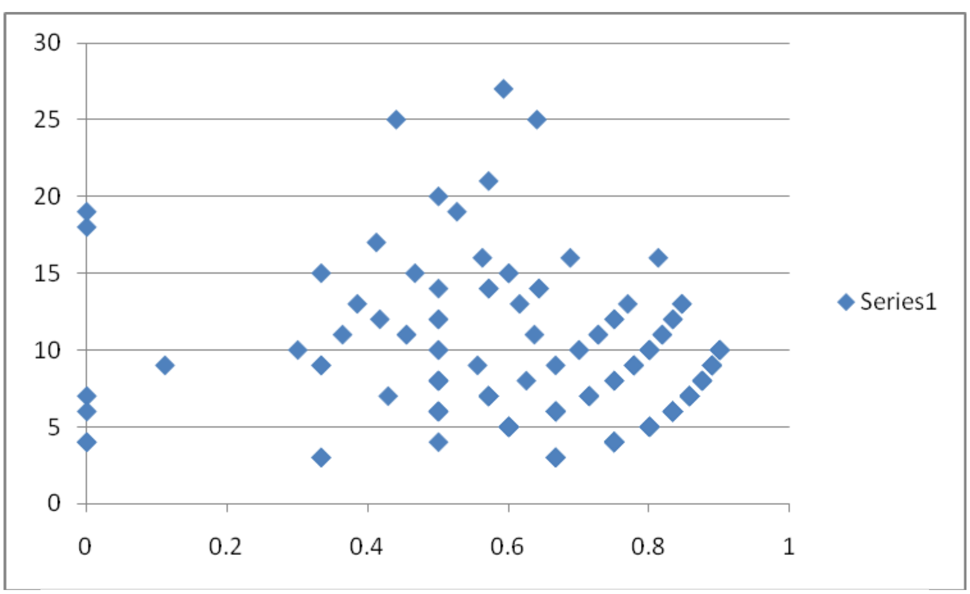


Figure 36: Number of Problems to Master vs. Percentage of Problems Correct

Plotting by problem set retains this lack of correlation. However, the resulting plots are hard to read. The apparent patterns above are probably from the fractions. Some of these problem set by problem set are shown in Figure 37

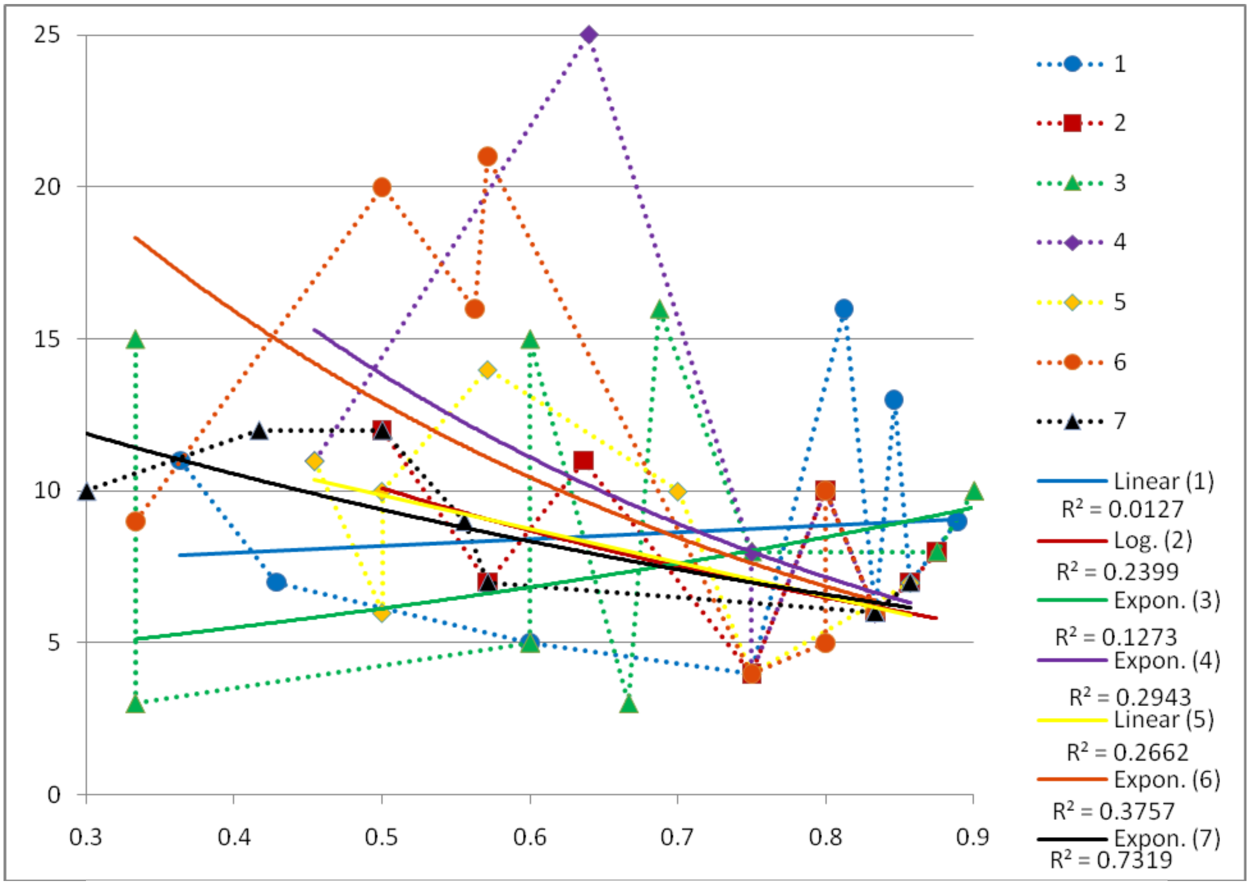


Figure 37: Number of Problems to Master vs. Percentage of Problems Correct with Trend lines For the Problem Sets with at Least 7 Students

There are no trend lines with reasonable r values, determining how close a fit it is, except high order polynomials, which if high enough order can be made to fit the data exactly due to the limited number of points. The non-polynomial trend line with the highest r value is displayed for each. You may note, however, that while there is no apparent correlation, we can't actually say there is no correlation.

3.4.7 Difficulty of Particular Skills

Since there was such a disparity between the effectiveness of different tutoring strategies when problems were split up into unit conversion and area/volume skills, we wanted to see if, perhaps, one type of problem was more difficult than another. The result of this analysis is shown in Table 13. The overall average includes students who mastered out without seeing tutoring. Unit conversion problems do not appear to be any easier or more difficult than average. This seems to point to the fact that the conclusion found in 3.4.2 is not based on the fact that one problem set was easier for students than the other. This gives credibility to the fact that Complete Explanations appear to be better for Unit Conversion problems, while Hints are better for Area/Volume problems.

Table 13: Difficulty of Problem Sets

Problem Type	Average		
	C.E.	**Hints**	**Overall**
Area	0.688322	0.664944	0.81521
Perimeter	0.593651	0.660398	0.81842
Surface Area	0.663492	0.657143	0.77284
Units	0.730926	0.619637	0.815917
Volume	0.725778	0.695788	0.876142
Overall	**0.700275**	**0.648648**	**0.819617**

3.4.8 Student Analysis of Time to Master

The following analysis is also aimed to determine if the type of tutoring (Complete Explanations vs. Hints) has an impact on the time for the students to complete the problem set. However, the analysis examined the time required for each student instead of for all students that took a given problem set. The analysis included the separation of student into top and bottom groups, as well as into quartiles. Table 14 shows a summary of the results of the average time and p-value for each condition. The initial data was filtered so that the outlier students with exceeding amount of time or attempts were excluded. Then only the student who has mastered both the Complete Explanations and Hints problem set were saved. The filtered data included 7 students in top half percentile, 10 students in the bottom percentile, 3 students in the 1st quartile, 7 students in the 2nd quartile, 4 students in the 3rd quartile, and 3 students in the 4th quartile. The data shows that for the top half of the student, Complete Explanation problem set require more time than Hint problem set. The average time differences between the Complete Explanation and Hint problem set for this group was about 46 seconds. The bottom half of the student did not show much difference in time for the Complete Explanation and Hints problem set. The average time for the Complete Explanation problem set was 2 seconds shorter than Hints. The result for each quartile has varied. With quartile 1 and quartile 4 students require more time in the Complete Explanation set and quartile 2 and quartile 3 students in Hints. The results are graphed in Figure 38. T-test was used to compare the difference of time between the students in the same ranking. The p-values obtained for each comparison did not indicate any statistically reliable difference between time to master using different tutoring strategies for any of the groups.

Table 14: Impact of tutoring strategy on completion time for each student

Tutoring Strategy	**Top half average time (s)**	**Bottom half average time (s)**	**1st quartile average time (s)**	**2nd quartile average time (s)**	**3rd quartile average time (s)**	**4th quartile average time (s)**
Complete Explanation	313.4	342.1	433.5	302.9	331.4	289.3
Hints	256.9	346.1	464	295.6	203.5	328.1
p-value	0.34	0.96	0.90	0.94	0.155	0.59

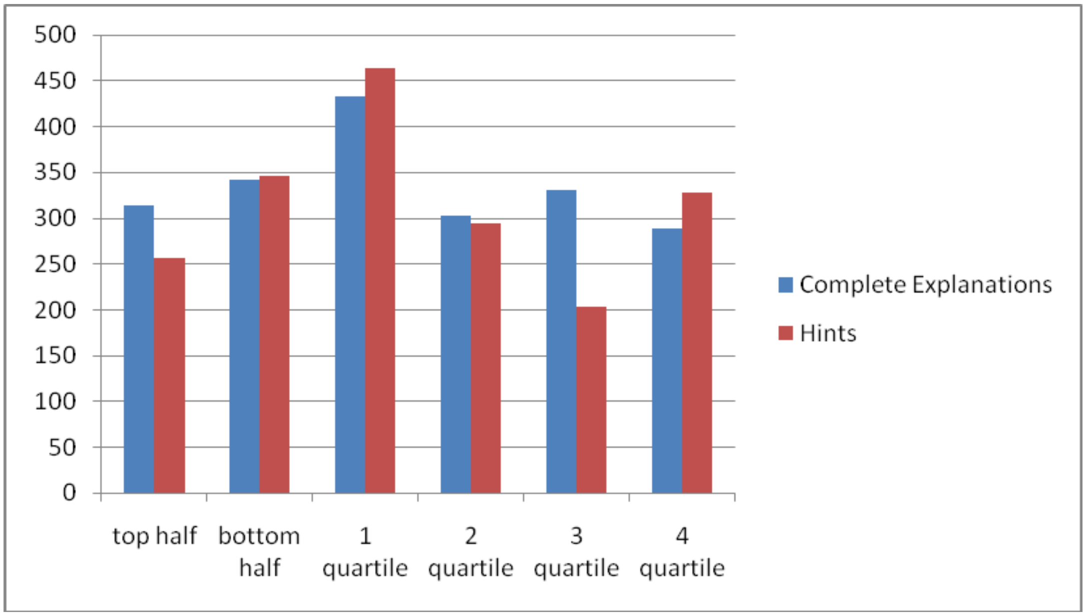


Figure 38: Impact of tutoring strategy on completion time for each student
Time (s) vs. Students

3.4.9 Analysis of tutoring strategy effect on student completion rate

In order to account for the fact that the number of valid data points is larger for hints than for complete explanation problems, we added the data points originally removed back into the problem set. The total data set consists of 502 students, with 243 Complete Explanation problems and 359 Hints problems. Students in the "no condition" were removed because they did not see any tutoring. This left 115 finished Complete Explanation problems and 154 Hints problems for a total of 269 problems. The average completion rate for Complete Explanation problems is 69.6% and the average for Hints problems was 77.3%. This difference is statistically significant based on a two-tailed T-Test value of 0.0305. The results are shown in Table 15.

Table 15: Summary of Completion Rate Analysis

User ID	Completed C.E.				Completed Hints			
	No	Yes	Total	% Finished	No	Yes	Total	% Finished
64525	1	3	4	75.0%	4	3	7	42.9%
70688		10	10	100.0%	1	8	9	88.9%
70702	1	4	5	80.0%	1	7	8	87.5%
70704	2	7	9	77.8%	1	8	9	88.9%
70707	2	1	3	33.3%	3	3	6	50.0%
70727		5	5	100.0%	2	5	7	71.4%
70730	2	8	10	80.0%	1	8	9	88.9%
70731		2	2	100.0%	1	2	3	66.7%
70733	2		2	0.0%	1	4	5	80.0%
70746	3	2	5	40.0%	4	7	11	63.6%
71740	2	2	4	50.0%	1	9	10	90.0%
71810	1		1	0.0%	1		1	0.0%
71824	2		2	0.0%		2	2	100.0%
71881	2	11	13	84.6%		13	13	100.0%
73684	3	1	4	25.0%	3	6	9	66.7%
73685	3	5	8	62.5%	2	7	9	77.8%
74384	2		2	0.0%	2	3	5	60.0%
74678		5	5	100.0%	1	5	6	83.3%
74698	2		2	0.0%	1	2	3	66.7%
75169	2	4	6	66.7%	4	8	12	66.7%
75361	2	3	5	60.0%	1	2	3	66.7%
80807	1	7	8	87.5%		7	7	100.0%
Grand Total	**35**	**80**	**115**	**69.6%**	**35**	**119**	**154**	**77.3%**

Continuing with this investigation, we asked sought to gain some insight into why this might be true. Do the students do many problems, but become unable to learn by this method? Do the students see that the problem is presented as Complete Explanation and give up? To answer this question, we used the pivot table reproduced as Appendix H. Here we have listed every incomplete problem as a data point.

There are many cases where the student gave up after one or two incorrect answers. Students usually gave up after only one attempt. There are almost twice as many cases where this happens for Hints problems (22 times) compared to Complete Explanation problems (12). This is not statistically reliable for showing that there is a difference, but it does show that if the students were to give up, it would not be because the problem type is complete explanation, so there must be another reason.

One possibility is that the student does give up on Complete Explanation problems after more problems done than when compared to Hints. This could be because it is faster to get another problem in Complete Explanation tutoring than in Hints. One student in the Complete Explanation case has 5 problems done with no correct answers. Other students do between 2 and 9 problems with some correct and some incorrect before giving up in both cases. This means giving up in less than a day, since 10 or 15 problems can be done in a day, depending on problem type. Unlike the case for 1 or 2 problems done incorrectly, here more complete explanation students gave up after completing this amount than students using hints. This possibility, therefore, can't be discounted.

The other possibility is that the students have trouble learning with Complete Explanation tutoring. The more unusual cases are the students who do many more problems before quitting. These students appear to be trying to learn the skill, but are likely not learning from the tutoring because they continually fail to get three or five correct in a row. Some students even keep on working for several days, not giving up. One student completed 20 problems and still was unable to master. Since the majority of these results occur within Complete Explanation tutoring, it is likely that some students have increased difficulty learning from Complete Explanation tutoring.

These results show that students might have more trouble learning with the Complete Explanation tutoring. It is not a conscious preference, since the students are actually less likely to give up after a single Complete Explanation problem. Students might give up after doing a larger number of problems on a single problem, but Complete Explanation problem sets don't take more problems to master. The most likely conclusion seems to be that students are giving up and trying a different problem set because they are having trouble learning the material.

4 Conclusion

There was not enough data to draw a statistically reliable conclusion regarding our hypothesis. There does appear to be a trend that hints tutoring is more effective for less advanced students, while complete explanation tutoring is more effective for more advanced students. It does appear that the more advanced a student is the more likely complete explanation tutoring will reduce the time required to master, but again there is not enough data to make a statistically reliable conclusion. Contrary to our expectations there appears to be no correlation between the problem set average and the number of problems to master. We have no explanation for this, and more study would be required to determine if this result is statistically reliable.

Although not originally hypothesized about, an interesting and statistically reliable trend was discovered in the data. It was found that Hints tutoring is more effective than Complete Explanations tutoring for area/volume problems, while complete explanation tutoring was more effective than hints tutoring for unit conversion problems. Statistically reliable differences were found in number to master as well as learning. Trends point to an actual difference in time to master as well. This difference is not statistically reliable, but if a future study were to examine this using a larger data set, a statistically reliable difference may be discovered.

Another interesting trend not originally hypothesized on regarding tutoring strategy impact on problem set completion percentage rate was discovered. Students were found to be approximately 7% more likely to complete a problem set when Hints tutoring was used compared to Complete Explanation tutoring. This result was statistically reliable.

Another statistically reliable result found during data mining was that Hints are considerably better for easier problems. Easier problems are defined as problem sets with an overall average of 85% or greater. Statistically reliable differences were found in number to master and learning, while there appears to be a trend towards Hints taking less time in easier problems. This data set is very small, so in order to confirm this result a larger data set would be required.

There do appear to be several substantial trends in the data that cannot be said with 95% certainty to be true. If the experiment were repeated with more students in the sample population, there would likely be more statistically reliable results. If the experiment was to be re-run in the future, it would be advisable to analyze unit conversion and area/volume problems separately since they yield significantly different results.

Appendix A: References

[1] Razzaq, L. & Heffernan, N. (2009) *To Tutor or Not to Tutor: That is the Question*. In Dimitrova, Mizoguchi, du Boulay & Graesser (Eds.) Proceedings of the 2009 Artificial Intelligence in Education Conference. IOS Press. pp. 457-464.Honorable Mention for Best Student Paper

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Appendix B: Unit Conversion between Systems ASSISTments

Original Content Created by Elizabeth Gould

Skill	Class
Unit Conversion Between Systems	7th Grade

Mastery Problem Set #8833	Number of Templates 14
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates

- 59048

Convert 17 miles to kilometers.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

* Number of miles goes from 2 to 41.

Assistment #59048 "59048 - mi to km"

Convert %v{x} miles to kilometers.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

%v{x*1.61}

Hints:

- Lets first think about the situation.

  Since kilometers are smaller than miles, **there are more kilometers than miles for the same distance**.
- Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from miles to kilometers. Since you are going from miles to kilometers, divide by the factor.

%v{x} mi = %v{x} mi * 1.61 $\frac{\text{km}}{\text{mi}}$ = %v{x} * 1.61 km = %v{x*1.61} km

Method 2

1 = $\frac{\mathbf{1.61\ km}}{\mathbf{1\ mi}}$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} mi = %v{x} mi * $\frac{\mathbf{1.61\ km}}{\mathbf{1\ mi}}$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} mi = %v{x} * 1.61 km = %v{x*1.61} km

Divide both top and bottom by the unit mi and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} mi = %v{x*1.61} km.

Type in %v{(((x*1.61)*100).round.to_f)/100}.

Assistment #60303 "60303 - mi to km"
Convert %v{x} miles to kilometers.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

%v{x*1.61}

Scaffold:

Here is a complete explanation:

Since kilometers are smaller than miles, **there are more kilometers than miles for the same**

distance.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from miles to kilometers. Since you are going from miles to kilometers, multiply by the factor.

%v{x} mi = %v{x} mi * 1.61 $\frac{\text{km}}{\textbf{mi}}$ = %v{x} * 1.61 km = %v{x*1.61} km

Method 2

1 = $\frac{\textbf{1.61 km}}{\textbf{1 mi}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} mi = %v{x} mi * $\frac{\textbf{1.61 km}}{\textbf{1 mi}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
%v{x} mi = %v{x} * 1.61 km = %v{x*1.61} km	Divide both top and bottom by the unit mi and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} mi = %v{x*1.61} km.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65822 "65822 - 59048 - mi to km

Convert 28 miles to kilometers.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

✓ 45.08

Hints:

- Lets first think about the situation.

  Since kilometers are smaller than miles, **there are more kilometers than miles for the same distance**.
- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from miles to kilometers. Since you are going from miles to kilometers, divide by the factor.

$$28 \text{ mi} = 28 \text{ mi} * 1.61 \frac{\text{km}}{\textbf{mi}} = 28 * 1.61 \text{ km} = 45.08 \text{ km}$$

Method 2

$$1 = \frac{\textbf{1.61 km}}{\textbf{1 mi}}$$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$28 \text{ mi} = 28 \text{ mi} * \frac{\textbf{1.61 km}}{\textbf{1 mi}}$$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$28 \text{ mi} = 28 * 1.61 \text{ km} = 45.08 \text{ km}$$

Divide both top and bottom by the unit mi and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 28 mi = 45.08 km.

Type in 45.08.

Assistment #66165 "66165 - 60303 - mi to km

Convert 39 miles to kilometers.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

✓ 62.79

Scaffold:

Here is a complete explanation:

Since kilometers are smaller than miles, **there are more kilometers than miles for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from miles to kilometers. Since you are going from miles to kilometers, multiply by the factor.

$$39 \text{ mi} = 39 \text{ mi} * 1.61 \frac{\text{km}}{\textbf{mi}} = 39 * 1.61 \text{ km} = 62.79 \text{ km}$$

Method 2

$$1 = \frac{\textbf{1.61 km}}{\textbf{1 mi}}$$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$39 \text{ mi} = 39 \text{ mi} * \frac{\textbf{1.61 km}}{\textbf{1 mi}}$$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$39 \text{ mi} = 39 * 1.61 \text{ km} = 62.79 \text{ km}$$

Divide both top and bottom by the unit mi and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 39 mi = 62.79 km.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 59095

Convert 39 kilometers to miles.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

* Number of kilometers goes from 2 to 41.

Assistment #59095 "59095 - km to mi"

Convert %v{x} kilometers to miles.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

%v{x/1.61}

%v{(((x/1.61)*100).round.to_f)/100}

Hints:

- Lets first think about the situation.

  Since kilometers are smaller than miles, **there are fewer miles than kilometers for the same distance**.

- Here will be shown two methods to solve this problem.

  <u>Method 1</u>

  You are given the conversion factor for going from miles to kilometers. Since you are going from kilometers to miles, divide by the factor.

$$\%v\{x\}\ \text{km} = \%v\{x\}\ \text{km} * \frac{1\ \text{mi}}{1.61\ \text{km}} = \frac{\%v\{x\}}{1.61}\ \text{mi} = \%v\{x/1.61\}\ \text{mi}$$

<u>Method 2</u>

$$1 = \frac{\mathbf{1\ mi}}{\mathbf{1.61\ km}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the

$$\%v\{x\}\ km = \%v\{x\}\ km * \frac{\mathbf{1\ mi}}{\mathbf{1.61\ km}}$$

equality. Dividing any number by itself results in 1.

Now multiply the given number by the conversion formula.

This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ km = \frac{\mathbf{\%v\{x\}}}{\mathbf{1.61}}\ mi = \%v\{x/1.61\}\ mi$$

Divide both top and bottom by the unit km and simplify.

Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} km = %v{x/1.61} mi which rounded to the nearest hundredth is %v{(((x/1.61)*100).round.to_f)/100} mi.

Type in %v{(((x/1.61)*100).round.to_f)/100}.

Assistment #60306 "60306 - km to mi"

Convert %v{x} kilometers to miles.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

%v{x/1.61}

%v{(((x/1.61)*100).round.to_f)/100}

Scaffold:

Here is a complete explanation:

Since kilometers are smaller than miles, **there are fewer miles than kilometers for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from miles to kilometers. Since you are going from kilometers to miles, divide by the factor.

%v{x} km = %v{x} km * 1 mi = %v{x} mi = %v{x/1.61}

mi

1.61 km 1.61

Method 2

$1 = \frac{\textbf{1 mi}}{\textbf{1.61 km}}$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} km = %v{x} km * $\frac{\textbf{1 mi}}{\textbf{1.61 km}}$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} km = $\frac{\textbf{\%v\{x\}}}{\textbf{1.61}}$ mi = %v{x/1.61} mi

Divide both top and bottom by the unit km and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} km = %v{x/1.61} mi which rounded to the nearest hundredth is %v{(((x/1.61)*100).round.to_f)/100} mi.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65859 "65859 - 59095 - km to mi

Convert 39 kilometers to miles.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

✗ 24.223602484472

✓ 24.22

Hints:

- Lets first think about the situation.

  Since kilometers are smaller than miles, **there are fewer miles than kilometers for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from miles to kilometers. Since you are going from kilometers to miles, divide by the factor.

$$39\text{ km} = 39\text{ km} * \frac{1\text{ mi}}{1.61\text{ km}} = \frac{39}{1.61}\text{ mi} = 24.223602484472$$

Method 2

$$1 = \frac{\mathbf{1\ mi}}{\mathbf{1.61\ km}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$39\text{ km} = 39\text{ km} * \frac{\mathbf{1\ mi}}{\mathbf{1.61\ km}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$39\text{ km} = \frac{\mathbf{39}}{\mathbf{1.61}}\text{ mi} = 24.223602484472\text{ mi}$$

Divide both top and bottom by the unit km and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 39 km = 24.223602484472 mi which rounded to the nearest hundredth is 24.22 mi.

Type in 24.22.

Assistment #66212 "66212 - 60306 - km to mi

Convert 22 kilometers to miles.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

Algebra:

✗ 13.6645962732919

✓ 13.66

Scaffold:

Here is a complete explanation:

Since kilometers are smaller than miles, **there are fewer miles than kilometers for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from miles to kilometers. Since you are going from kilometers to miles, divide by the factor.

$$22\text{ km} = 22\text{ km} * \frac{1\text{ mi}}{1.61\text{ km}} = \frac{22}{1.61}\text{ mi} = 13.6645962732919$$

Method 2

$$1 = \frac{\mathbf{1\ mi}}{\mathbf{1.61\ km}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing

$$22 \text{ km} = 22 \text{ km} * \frac{\mathbf{1\ mi}}{\mathbf{1.61\ km}}$$

both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

Now multiply the given number by the conversion formula.

This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$22 \text{ km} = \frac{\mathbf{22}}{\mathbf{1.61}} \text{ mi} = 13.6645962732919 \text{ mi}$$

Divide both top and bottom by the unit km and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 22 km = 13.6645962732919 mi which rounded to the nearest hundredth is 13.66 mi.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 59096

Convert 2 feet to meters.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

* Number of feet goes from 2 to 41.

Assistment #59096 "59096 - ft to m"

Convert %v{x} feet to meters.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

%v{x/3.28}
%v{(((x/3.28)*100).round.to_f)/100}

Hints:

- Lets first think about the situation.

  Since feet are smaller than meters, **there are fewer meters than feet for the same distance**.
- Here will be shown two methods to solve this problem.

  Method 1
  You are given the conversion factor for going from meters to feet. Since you are going from feet to meters, divide by the factor.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * \frac{1\ \text{m}}{3.28\ \text{ft}} = \frac{\%v\{x\}}{3.28}\ \text{m} = \%v\{x/3.28\}\ \text{m}$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{ft} = \frac{\mathbf{\%v\{x\}}}{\mathbf{3.28}}\ \text{m} = \%v\{x/3.28\}\ \text{m}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} ft = %v{x/3.28} m which rounded to the nearest hundredth is %v{(((x/3.28)*100).round.to_f)/100} m.

Type in %v{(((x/3.28)*100).round.to_f)/100}.

Assistment #60307 "60307 - ft to m"
Convert %v{x} feet to meters.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

%v{x/3.28}

%v{(((x/3.28)*100).round.to_f)/100}

Scaffold:

Here is a complete explanation:

Since feet are smaller than meters, **there are fewer meters than feet for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from meters to feet. Since you are going from feet to meters, divide by the factor.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * \frac{1\ \text{m}}{3.28\ \text{ft}} = \frac{\%v\{x\}}{3.28}\ \text{m} = \%v\{x/3.28\}\ \text{m}$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps
the equality unchanged the left hand side remains the same.

Divide both top and bottom by the

%v{x} ft = $\frac{\textbf{\%v\{x\}}}{\textbf{3.28}}$ m = %v{x/3.28} m

unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} ft = %v{x/3.28} m which rounded to the nearest hundredth is %v{(((x/3.28)*100).round.to_f)/100} m.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65871 "65871 - 59096 - ft to m

Convert 37 feet to meters.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

✗ 11.280487804878

✓ 11.28

Hints:

- Lets first think about the situation.

  Since feet are smaller than meters, **there are fewer meters than feet for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from meters to feet. Since you are going from feet to meters, divide by the factor.

$$37 \text{ ft} = 37 \text{ ft} * \frac{1 \text{ m}}{3.28 \text{ ft}} = \frac{37}{3.28} \text{ m} = 11.280487804878 \text{ m}$$

Method 2

1 = **1 m**

Write conversion formula as a fraction by dividing one side by the other.

$\overline{}$

3.28 ft

This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$37 \text{ ft} = 37 \text{ ft} * \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$37 \text{ ft} = \frac{\mathbf{37}}{\mathbf{3.28}} \text{ m} = 11.280487804878 \text{ m}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 37 ft = 11.280487804878 m which rounded to the nearest hundredth is 11.28 m.

Type in 11.28.

Assistment #66129 "66129 - 60307 - ft to m
Convert 20 feet to meters.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

✗ 6.09756097560976

✓ 6.1

Scaffold:

Here is a complete explanation:

Since feet are smaller than meters, **there are fewer meters than feet for the same distance**.

Here will be shown two methods to solve this problem.

Method 1
You are given the conversion factor for going from meters to feet. Since you are going from feet to meters, divide by the factor.

$$20\ ft = 20\ ft * \frac{1\ m}{3.28\ ft} = \frac{20}{3.28}\ m = 6.09756097560976$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$20\ ft = 20\ ft * \frac{\mathbf{1\ m}}{\mathbf{3.28\ ft}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps
the equality unchanged the left hand side remains the same.

$$20\ ft = \frac{\mathbf{20}}{\mathbf{3.28}}\ m = 6.09756097560976\ m$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 20 ft = 6.09756097560976 m which rounded to the nearest hundredth is 6.1 m.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 59093

Convert 16 meters to feet.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

* Number of meters goes from 2 to 41.

Assistment #59093 "59093 - m to ft"
Convert %v{x} meters to feet.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

%v{x*3.28}

Hints:

- Lets first think about the situation.

  Since feet are smaller than meters, **there are more feet than meters for the same distance**.
- Here will be shown two methods to solve this problem.

  Method 1
  You are given the conversion factor for going from meters to feet. Since you are going from meters to feet, divide by the factor.

%v{x} m = %v{x} m * 3.28 $\frac{\text{ft}}{\textbf{m}}$ = %v{x} * 3.28 ft = %v{x*3.28} ft

Method 2

1 = $\frac{\textbf{3.28 ft}}{\textbf{1 m}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} m = %v{x} m * $\frac{\textbf{3.28 ft}}{\textbf{1 m}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
%v{x} m = %v{x} * 3.28 ft = %v{x*3.28} ft	Divide both top and bottom by the unit m and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} m = %v{x*3.28} ft.

Type in %v{(((x*3.28)*100).round.to_f)/100}.

Assistment #60305 "60305 - m to ft"
Convert %v{x} meters to feet.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

%v{x*3.28}

Scaffold:

Here is a complete explanation:

Since feet are smaller than meters, **there are more feet than meters for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from meters to feet. Since you are going from meters to feet, divide by the factor.

%v{x} m = %v{x} m * 3.28 $\frac{\text{ft}}{\textbf{m}}$ = %v{x} * 3.28 ft = %v{x*3.28} ft

Method 2

1 = $\frac{\textbf{3.28 ft}}{\textbf{1 m}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} m = %v{x} m * $\frac{\textbf{3.28 ft}}{}$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

1 m

%v{x} m = %v{x} * 3.28 ft = %v{x*3.28} ft

Divide both top and bottom by the unit m and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} m = %v{x*3.28} ft.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65847 "65847 - 59093 - m to ft

Convert 8 meters to feet.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:

✓ 26.24

Hints:

- Lets first think about the situation.

  Since feet are smaller than meters, **there are more feet than meters for the same distance**.
- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from meters to feet. Since you are going from meters to feet, divide by the factor.

$$8\text{ m} = 8\text{ m} * 3.28\,\frac{\text{ft}}{\textbf{m}} = 8 * 3.28\text{ ft} = 26.24\text{ ft}$$

Method 2

1 = **3.28 ft**

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number

1 m maintains the equality. Dividing any number by itself results in 1.

$8\ m = 8\ m * \frac{3.28\ ft}{1\ m}$ Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

8 m = 8 * 3.28 ft = 26.24 ft Divide both top and bottom by the unit m and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 8 m = 26.24 ft.

Type in 26.24.

Assistment #66202 "66202 - 60305 - m to ft
Convert 38 meters to feet.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

Algebra:
✓ 124.64

Scaffold:
Here is a complete explanation:

Since feet are smaller than meters, **there are more feet than meters for the same distance**.

Here will be shown two methods to solve this problem.

Method 1
You are given the conversion factor for going from meters to feet. Since you are going from meters to feet, divide by the factor.

38 m = 38 m * 3.28 ft = 38 * 3.28 ft = 124.64 ft

m

Method 2

$1 = \dfrac{3.28 \text{ ft}}{1 \text{ m}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$38 \text{ m} = 38 \text{ m} * \dfrac{3.28 \text{ ft}}{1 \text{ m}}$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$38 \text{ m} = 38 * 3.28 \text{ ft} = 124.64 \text{ ft}$

Divide both top and bottom by the unit m and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 38 m = 124.64 ft.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 60181

Convert 24 yards to meters.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

* Number of yards goes from 2 to 41.

Assistment #60181 "60181 - yd to m"
Convert %v{x} yards to meters.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

%v{x/1.09}

%v{(((x/1.09)*100).round.to_f)/100}

Hints:

- Lets first think about the situation.

  Since yards are smaller than meters, **there are fewer meters than yards for the same distance**.
- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from meters to yards. Since you are going from yards to meters, divide by the factor.

$$\%v\{x\}\ \text{yd} = \%v\{x\}\ \text{yd} * \frac{1\ \text{m}}{1.09\ \text{yd}} = \frac{\%v\{x\}}{1.09}\ \text{m} = \%v\{x/1.09\}\ \text{m}$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{yd} = \%v\{x\}\ \text{yd} * \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{yd} = \frac{\mathbf{\%v\{x\}}}{\mathbf{1.09}}\ \text{m} = \%v\{x/1.09\}\ \text{m}$$

Divide both top and bottom by the unit yd and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} yd = %v{x/1.09} m which rounded to the nearest hundredth is %v{(((x/1.09)*100).round.to_f)/100} m.

Type in %v{(((x/1.09)*100).round.to_f)/100}.

Assistment #60309 "60309 - yd to m"
Convert %v{x} yards to meters.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

%v{x/1.09}

%v{(((x/1.09)*100).round.to_f)/100}

Scaffold:

Here is a complete explanation:

Since yards are smaller than meters, **there are fewer meters than yards for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from meters to yards. Since you are going from yards to meters, divide by the factor.

$$\%v\{x\}\text{ yd} = \%v\{x\}\text{ yd} * \frac{1\text{ m}}{1.09\text{ yd}} = \frac{\%v\{x\}}{1.09}\text{ m} = \%v\{x/1.09\}\text{ m}$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality.
Dividing any number by itself results in 1.

$$\%v\{x\}\text{ yd} = \%v\{x\}\text{ yd} * \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} yd = $\frac{\textbf{\%v\{x\}}}{\textbf{1.09}}$ m = %v{x/1.09} m

Divide both top and bottom by the unit yd and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} yd = %v{x/1.09} m which rounded to the nearest hundredth is %v{(((x/1.09)*100).round.to_f)/100} m.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65812 "65812 - 60181 - yd to m

Convert 11 yards to meters.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

✗ 10.0917431192661

✓ 10.09

Hints:

- Lets first think about the situation.

  Since yards are smaller than meters, **there are fewer meters than yards for the same distance**.
- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from meters to yards. Since you are going from yards to meters, divide by the factor.

$$11 \text{ yd} = 11 \text{ yd} * \frac{1 \text{ m}}{1.09 \text{ yd}} = \frac{11}{1.09} \text{ m} = 10.0917431192661 \text{ m}$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$11\ yd = 11\ yd * \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$11\ yd = \frac{\mathbf{11}}{\mathbf{1.09}}\ m = 10.0917431192661\ m$$

Divide both top and bottom by the unit yd and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 11 yd = 10.0917431192661 m which rounded to the nearest hundredth is 10.09 m.

Type in 10.09.

Assistment #66180 "66180 - 60309 - yd to m

Convert 17 yards to meters.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

✗ 15.5963302752294

✓ 15.6

Scaffold:

Here is a complete explanation:

Since yards are smaller than meters, **there are fewer meters than yards for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from meters to yards. Since you are going from yards to meters, divide by the factor.

$$17 \text{ yd} = 17 \text{ yd} * \frac{1 \text{ m}}{1.09 \text{ yd}} = \frac{17}{1.09} \text{ m} = 15.5963302752294 \text{ m}$$

Method 2

$$1 = \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$17 \text{ yd} = 17 \text{ yd} * \frac{\mathbf{1\ m}}{\mathbf{1.09\ yd}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$17 \text{ yd} = \frac{\mathbf{17}}{\mathbf{1.09}} \text{ m} = 15.5963302752294 \text{ m}$$

Divide both top and bottom by the unit yd and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 17 yd = 15.5963302752294 m which rounded to the nearest hundredth is 15.6 m.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 60180

Convert 38 meters to yards.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

* Number of meters goes from 2 to 41.

Assistment #60180 "60180 - m to yd"
Convert %v{x} meters to yards.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

%v{x*1.09}

Hints:

- Lets first think about the situation.

  Since yards are smaller than meters, **there are more yards than meters for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1
  You are given the conversion factor for going from meters to yards. Since you are going from meters to yards, divide by the factor.

%v{x} m = %v{x} m * 1.09 $\frac{\text{yd}}{\textbf{m}}$ = %v{x} * 1.09 yd = %v{x*1.09} yd

Method 2

1 = $\frac{\textbf{1.09 yd}}{\textbf{1 m}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} m = %v{x} m * $\frac{\textbf{1.09 yd}}{\textbf{1 m}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
%v{x} m = %v{x} * 1.09	Divide both top and bottom by the unit m and simplify.

yd = %v{x*1.09} yd

Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} m = %v{x*1.09} yd.

Type in %v{(((x*1.09)*100).round.to_f)/100}.

Assistment #60308 "60308 - m to yd"
Convert %v{x} meters to yards.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

%v{x*1.09}

Scaffold:

Here is a complete explanation:

Since yards are smaller than meters, **there are more yards than meters for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from meters to yards. Since you are going from meters to yards, divide by the factor.

%v{x} m = %v{x} m * 1.09 $\frac{\text{yd}}{\text{m}}$ = %v{x} * 1.09 yd = %v{x*1.09} yd

Method 2

$1 = \frac{\mathbf{1.09\ yd}}{\mathbf{1\ m}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ m = \%v\{x\}\ m * \frac{1.09\ yd}{1\ m}$$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} m = %v{x} * 1.09 yd = %v{x*1.09} yd

Divide both top and bottom by the unit m and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} m = %v{x*1.09} yd.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65899 "65899 - 60180 - m to yc

Convert 29 meters to yards.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

✓ 31.61

Hints:

- Lets first think about the situation.

  Since yards are smaller than meters, **there are more yards than meters for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from meters to yards. Since you are going from meters to yards, divide by the factor.

$$29\ m = 29\ m * 1.09 \frac{yd}{m} = 29 * 1.09\ yd = 31.61\ yd$$

Method 2

$1 = \dfrac{\mathbf{1.09\ yd}}{\mathbf{1\ m}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$29\ m = 29\ m * \dfrac{\mathbf{1.09\ yd}}{\mathbf{1\ m}}$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$29\ m = 29 * 1.09\ yd = 31.61\ yd$

Divide both top and bottom by the unit m and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 29 m = 31.61 yd.

Type in 31.61.

Assistment #66152 "66152 - 60308 - m to yd

Convert 24 meters to yards.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

Algebra:

✓ 26.16

Scaffold:

Here is a complete explanation:

Since yards are smaller than meters, **there are more yards than meters for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from meters to yards. Since you are going from meters to yards, divide by the factor.

$24\ m = 24\ m * 1.09 \frac{yd}{m} = 24 * 1.09\ yd = 26.16\ yd$

Method 2

$1 = \frac{\mathbf{1.09\ yd}}{\mathbf{1\ m}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$24\ m = 24\ m * \frac{\mathbf{1.09\ yd}}{\mathbf{1\ m}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
24 m = 24 * 1.09 yd = 26.16 yd	Divide both top and bottom by the unit m and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 24 m = 26.16 yd.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 59091

Convert 13 inches to centimeters.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

* Number of inches goes from 2 to 41.

Assistment #59091 "59091 - in to cm"

Convert %v{x} inches to centimeters.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

%v{x*2.54}

Hints:

- Lets first think about the situation.

  Since centimeters are smaller than inches, **there are more centimeters than inches for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from inches to centimeters. Since you are going from inches to centimeters, multiply by the conversion factor.

%v{x} in = %v{x} in * 2.54 $\frac{\text{cm}}{\text{in}}$ = %v{x} * 2.54 cm = %v{x*2.54} cm

Method 2

1 = $\frac{\textbf{2.54 cm}}{\textbf{1 in}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} in = %v{x} in * $\frac{\textbf{2.54 cm}}{\textbf{1 in}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
%v{x} in = **%v{x} * 2.54** cm = %v{x*2.54} cm	Divide both top and bottom by the unit in and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} in = %v{x*2.54} cm.

Type in %v{(((x*2.54)*100).round.to_f)/100}.

Assistment #60304 "60304 - in to cm"
Convert %v{x} inches to centimeters.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

%v{x*2.54}

Scaffold:

Here is a complete explanation:

Since centimeters are smaller than inches, **there are more centimeters than inches for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from inches to centimeters. Since you are going from inches to centimeters, multiply by the conversion factor.

$$\%v\{x\}\ \text{in} = \%v\{x\}\ \text{in} * 2.54\ \frac{\text{cm}}{\text{in}} = \%v\{x\} * 2.54\ \text{cm} = \%v\{x*2.54\}\ \text{cm}$$

Method 2

$1 = \dfrac{\mathbf{2.54\ cm}}{\mathbf{1\ in}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$\%v\{x\}\ \text{in} = \%v\{x\}\ \text{in} * \dfrac{\mathbf{2.54\ cm}}{\mathbf{1\ in}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
%v{x} in = **%v{x} * 2.54** cm = %v{x*2.54}	Divide both top and bottom by the unit in and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

cm

Both methods show that %v{x} in = %v{x*2.54} cm.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65881 "65881 - 59091 - in to cm

Convert 6 inches to centimeters.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

✓ 15.24

Hints:

- Lets first think about the situation.

  Since centimeters are smaller than inches, **there are more centimeters than inches for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from inches to centimeters. Since you are going from inches to centimeters, multiply by the conversion factor.

$$6 \text{ in} = 6 \text{ in} * 2.54 \frac{\text{cm}}{\text{in}} = 6 * 2.54 \text{ cm} = 15.24 \text{ cm}$$

Method 2

$$1 = \frac{\mathbf{2.54\ cm}}{\mathbf{1\ in}}$$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

6 in = 6 **2.54**

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps in * **cm** / **1 in** the equality unchanged the left hand side remains the same.

6 in = **6 * 2.54** cm = 15.24 cm

Divide both top and bottom by the unit in and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 6 in = 15.24 cm.

Type in 15.24.

Assistment #66189 "66189 - 60304 - in to cm

Convert 41 inches to centimeters.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

✓ 104.14

Scaffold:

Here is a complete explanation:

Since centimeters are smaller than inches, **there are more centimeters than inches for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from inches to centimeters. Since you are going from inches to centimeters, multiply by the conversion factor.

$$41 \text{ in} = 41 \text{ in} * 2.54 \frac{\text{cm}}{\text{in}} = 41 * 2.54 \text{ cm} = 104.14 \text{ cm}$$

Method 2

$1 = \frac{\mathbf{2.54\ cm}}{\mathbf{1\ in}}$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$41\ in = 41\ in * \frac{\mathbf{2.54\ cm}}{\mathbf{1\ in}}$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

41 in = **41 * 2.54** cm = 104.14 cm

Divide both top and bottom by the unit in and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 41 in = 104.14 cm.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57651

Convert 12 centimeters to inches.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

* Number of centimeters goes from 2 to 41.

Assistment #57651 "57651 - cm to in"
Convert %v{x} centimeters to inches.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.
Algebra:

%v{x/2.54}
%v{(((x/2.54)*100).round.to_f)/100}

Hints:

- Lets first think about the situation.

  Since centimeters are smaller than inches, **there are fewer inches than centimeters for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1
  You are given the multiple for going from inches to centimeters. Since you are going from centimeters to inches, divide by the multiple (divide %v{x} by 2.54).

$$\%v\{x\}\ \text{cm} = \%v\{x\}\ \text{cm} * \frac{1\ \text{in}}{2.54\ \text{cm}} = \frac{\%v\{x\}}{2.54}\ \text{in} = \%v\{x/2.54\}\ \text{in}$$

Method 2

$$1 = \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{cm} = \%v\{x\}\ \text{cm} * \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{cm} = \frac{\mathbf{\%v\{x\}}}{\mathbf{2.54}}\ \text{in} = \%v\{x/2.54\}\ \text{in}$$

Divide both top and bottom by the unit cm and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} cm = %v{x/2.54} in which rounded to the nearest hundredth is %v{(((x/2.54)*100).round.to_f)/100} in.

Type in %v{(((x/2.54)*100).round.to_f)/100}.

Assistment #60302 "60302 - cm to in"

Convert %v{x} centimeters to inches.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

%v{x/2.54}

%v{(((x/2.54)*100).round.to_f)/100}

Scaffold:

Here is a complete explanation:

Since centimeters are smaller than inches, **there are fewer inches than centimeters for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the multiple for going from inches to centimeters. Since you are going from centimeters to inches, divide by the multiple (divide %v{x} by 2.54).

$$\%v\{x\}\ \text{cm} = \%v\{x\}\ \text{cm} * \frac{1\ \text{in}}{2.54\ \text{cm}} = \frac{\%v\{x\}}{2.54}\ \text{in} = \%v\{x/2.54\}\ \text{in}$$

Method 2

$$1 = \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality.
Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{cm} = \%v\{x\}\ \text{cm} * \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps
the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{cm} = \frac{\%v\{x\}}{2.54}\ \text{in} = \%v\{x/2.54\}\ \text{in}$$

Divide both top and bottom by the unit cm and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} cm = %v{x/2.54} in which rounded to the nearest hundredth is %v{(((x/2.54)*100).round.to_f)/100} in.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65837 "65837 - cm to in

Convert 20 centimeters to inches.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

✗ 7.8740157480315

✓ 7.87

Hints:

- Lets first think about the situation.

  Since centimeters are smaller than inches, **there are fewer inches than centimeters for the same distance**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the multiple for going from inches to centimeters. Since you are going from centimeters to inches, divide by the multiple (divide 20 by 2.54).

$$20\ \text{cm} = 20\ \text{cm} * \frac{1\ \text{in}}{2.54\ \text{cm}} = \frac{20}{2.54}\ \text{in} = 7.8740157480315\ \text{in}$$

Method 2

$$1 = \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$20\ cm = 20\ cm * \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$20\ cm = \frac{\mathbf{20}}{\mathbf{2.54}}\ in = 7.8740157480315\ in$$

Divide both top and bottom by the unit cm and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 20 cm = 7.8740157480315 in which rounded to the nearest hundredth is 7.87 in.

Type in 7.87.

Assistment #66146 "66146 - 60302 - cm to ir
Convert 38 centimeters to inches.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

Algebra:

✗	14.9606299212598
✓	14.96

Scaffold:

Here is a complete explanation:

Since centimeters are smaller than inches, **there are fewer inches than centimeters for the same distance**.

Here will be shown two methods to solve this problem.

Method 1

You are given the multiple for going from inches to centimeters. Since you are going from centimeters to inches, divide by the multiple (divide 38 by 2.54).

$$38\text{ cm} = 38\text{ cm} * \frac{1\text{ in}}{2.54\text{ cm}} = \frac{38}{2.54}\text{ in} = 14.9606299212598\text{ in}$$

Method 2

$$1 = \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$38\text{ cm} = 38\text{ cm} * \frac{\mathbf{1\ in}}{\mathbf{2.54\ cm}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$38\text{ cm} = \frac{\mathbf{38}}{\mathbf{2.54}}\text{ in} = 14.9606299212598\text{ in}$$

Divide both top and bottom by the unit cm and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 38 cm = 14.9606299212598 in which rounded to the nearest hundredth is 14.96 in.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 60186

Convert 12 kilograms to pounds.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

* Number of kilograms goes from 2 to 41.

Assistment #60186 "60186 - kg to lb"
Convert %v{x} kilograms to pounds.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

%v{x*2.20}

Hints:

- Lets first think about the situation.

  Since pounds are smaller than kilograms, **there are more pounds than kilograms for the same mass**.

- Here will be shown two methods to solve this problem.

  Method 1
  You are given the conversion factor for going from kilograms to pounds. Since you are going from kilograms to pounds, divide by the factor.

%v{x} kg = %v{x} kg * 2.20 $\frac{\text{lb}}{\textbf{kg}}$ = %v{x} * 2.20 lb = %v{x*2.20} lb

Method 2

1 = $\frac{\textbf{2.20 lb}}{\textbf{1 kg}}$ Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} kg = %v{x} kg * $\frac{\textbf{2.20 lb}}{\textbf{1 kg}}$ Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} kg = %v{x} * 2.20 Divide both top and bottom by the unit kg and simplify.

lb = %v{x*2.20} lb

Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} kg = %v{x*2.20} lb.

Type in %v{(((x*2.20)*100).round.to_f)/100}.

Assistment #60310 "60310 - kg to lb"
Convert %v{x} kilograms to pounds.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

%v{x*2.20}

Scaffold:

Here is a complete explanation:

Since pounds are smaller than kilograms, **there are more pounds than kilograms for the same mass**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from kilograms to pounds. Since you are going from kilograms to pounds, divide by the factor.

%v{x} kg = %v{x} kg * 2.20 $\frac{\text{lb}}{\textbf{kg}}$ = %v{x} * 2.20 lb = %v{x*2.20} lb

Method 2

$1 = \frac{\textbf{2.20 lb}}{\textbf{1 kg}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in

1.

%v{x} kg = %v{x} kg *	**2.20 lb** / **1 kg**	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
%v{x} kg = %v{x} * 2.20 lb = %v{x*2.20} lb		Divide both top and bottom by the unit kg and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} kg = %v{x*2.20} lb.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #66225 "66225 - 60186 - kg to lb"

Convert 15 kilograms to pounds.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

✓ 33

Hints:

- Lets first think about the situation.

Since pounds are smaller than kilograms, **there are more pounds than kilograms for the same mass**.

- Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from kilograms to pounds. Since you are going from kilograms to pounds, divide by the factor.

$$15\ \text{kg} = 15\ \text{kg} * 2.20\ \frac{\text{lb}}{\textbf{kg}} = 15 * 2.20\ \text{lb} = 33\ \text{lb}$$

Method 2

$1 = \frac{\mathbf{2.20\ lb}}{\mathbf{1\ kg}}$	Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$15\ kg = 15\ kg * \frac{\mathbf{2.20\ lb}}{\mathbf{1\ kg}}$	Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.
$15\ kg = 15 * 2.20\ lb = 33\ lb$	Divide both top and bottom by the unit kg and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 15 kg = 33 lb.

Type in 33.

Assistment #66336 "66336 - 60310 - kg to lb"

Convert 40 kilograms to pounds.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

✓ 88

Scaffold:

Here is a complete explanation:

Since pounds are smaller than kilograms, **there are more pounds than kilograms for the same mass**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from kilograms to pounds. Since you are going from kilograms to pounds, divide by the factor.

$$40\ kg = 40\ kg * 2.20\ \frac{lb}{\mathbf{kg}} = 40 * 2.20\ lb = 88\ lb$$

Method 2

$$1 = \frac{\mathbf{2.20\ lb}}{\mathbf{1\ kg}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$40\ kg = 40\ kg * \frac{\mathbf{2.20\ lb}}{\mathbf{1\ kg}}$$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

40 kg = 40 * 2.20 lb = 88 lb

Divide both top and bottom by the unit kg and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 40 kg = 88 lb.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 60187

Convert 41 pounds to kilograms.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

* Number of pounds goes from 2 to 41.

Assistment #60187 "60187 - lb to kg"
Convert %v{x} pounds to kilograms.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

%v{x/2.20}

%v{(((x/2.20)*100).round.to_f)/100}

Hints:

- Lets first think about the situation.

Since pounds are smaller than kilograms, **there are fewer kilograms than pounds for the same mass**.

- Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from kilograms to pounds. Since you are going from pound to kilograms, divide by the factor.

$$\%v\{x\}\ \text{lb} = \%v\{x\}\ \text{lb} * \frac{1\ \text{kg}}{2.20\ \text{lb}} = \frac{\%v\{x\}}{2.20}\ \text{kg} = \%v\{x/2.20\}\ \text{kg}$$

Method 2

$$1 = \frac{\mathbf{1\ kg}}{\mathbf{2.20\ lb}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{lb} = \%v\{x\}\ \text{lb} * \frac{\mathbf{1\ kg}}{\mathbf{2.20\ lb}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{lb} = \frac{\mathbf{\%v\{x\}}}{\mathbf{2.20}}\ \text{kg} = \%v\{x/2.20\}\ \text{kg}$$

Divide both top and bottom by the unit lb and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} lb = %v{x/2.20} kg which rounded to the nearest hundredth is %v{(((x/2.20)*100).round.to_f)/100} kg.

Type in %v{(((x/2.20)*100).round.to_f)/100}.

Assistment #60311 "60311 - lb to kg"
Convert %v{x} pounds to kilograms.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

%v{x/2.20}

%v{(((x/2.20)*100).round.to_f)/100}

Scaffold:

Here is a complete explanation:

Since pounds are smaller than kilograms, **there are fewer kilograms than pounds for the same mass**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from kilograms to pounds. Since you are going from pound to kilograms, divide by the factor.

%v{x} lb = %v{x} lb * $\frac{\text{1 kg}}{\text{2.20 lb}}$ = $\frac{\text{\%v\{x\}}}{2.20}$ kg = %v{x/2.20} kg

Method 2

1 = $\frac{\textbf{1 kg}}{\textbf{2.20 lb}}$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} lb = %v{x} lb * $\frac{\textbf{1 kg}}{\textbf{2.20 lb}}$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} lb = $\frac{\textbf{\%v\{x\}}}{}$ kg = %v{x/2.20} kg

Divide both top and bottom by the unit lb and simplify.
Just as a number divided by itself is

2.20 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} lb = %v{x/2.20} kg which rounded to the nearest hundredth is %v{(((x/2.20)*100).round.to_f)/100} kg.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #66243 "66243 - 60187 - lb to kg"

Convert 7 pounds to kilograms.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

Algebra:

✗ 3.18181818181818

✓ 3.18

Hints:

- Lets first think about the situation.

Since pounds are smaller than kilograms, **there are fewer kilograms than pounds for the same mass**.

- Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from kilograms to pounds. Since you are going from pound to kilograms, divide by the factor.

$$7\text{ lb} = 7\text{ lb} * \frac{1\text{ kg}}{2.20\text{ lb}} = \frac{7}{2.20}\text{ kg} = 3.18181818181818\text{ kg}$$

Method 2

$$1 = \frac{\mathbf{1\ kg}}{\mathbf{2.20\ lb}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$7\text{ lb} = 7\text{ lb} * \mathbf{1\ kg}$$

Now multiply the given number by the conversion formula.

$$\overline{\quad\quad}$$
2.20 lb

This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$7\ \text{lb} = \frac{\mathbf{7}}{\mathbf{2.20}}\ \text{kg} = 3.18181818181818\ \text{kg}$$

Divide both top and bottom by the unit lb and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 7 lb = 3.18181818181818 kg which rounded to the nearest hundredth is 3.18 kg.

Type in 3.18.

Assistment #66368 "66368 - 60311 - lb to kg"
Convert 30 pounds to kilograms.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.
Algebra:
✗ 13.6363636363636
✓ 13.64
Scaffold:
Here is a complete explanation:

Since pounds are smaller than kilograms, **there are fewer kilograms than pounds for the same mass**.

Here will be shown two methods to solve this problem.

Method 1
You are given the conversion factor for going from kilograms to pounds. Since you are going from pound to kilograms, divide by the factor.

$$30\ \text{lb} = 30\ \text{lb} * \frac{1\ \text{kg}}{2.20\ \text{lb}} = \frac{30}{2.20}\ \text{kg} = 13.6363636363636\ \text{kg}$$

Method 2

$$1 = \frac{\mathbf{1\ kg}}{\quad}$$

Write conversion formula as a fraction by dividing one side by the other.

2.20 lb

This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$30 \text{ lb} = 30 \text{ lb} * \frac{\mathbf{1\ kg}}{\mathbf{2.20\ lb}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$30 \text{ lb} = \frac{\mathbf{30}}{\mathbf{2.20}} \text{ kg} = 13.6363636363636 \text{ kg}$$

Divide both top and bottom by the unit lb and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 30 lb = 13.6363636363636 kg which rounded to the nearest hundredth is 13.64 kg.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 60189

Convert 25 quarts to liters.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

* Number of quarts goes from 2 to 41.

Assistment #60189 "60189 - qt to L"

Convert %v{x} quarts to liters.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

%v{x/1.06}

%v{(((x/1.06)*100).round.to_f)/100}

Hints:

- Lets first think about the situation.

  Since quarts are smaller than liters, **there are fewer liters than quarts for the same**

volume.

- Here will be shown two methods to solve this problem.

Method 1
You are given the conversion factor for going from liters to quarts. Since you are going from quarts to liters, divide by the factor.

$$\%v\{x\}\ \text{qt} = \%v\{x\}\ \text{qt} * \frac{1\ \text{L}}{1.06\ \text{qt}} = \frac{\%v\{x\}}{1.06}\ \text{L} = \%v\{x/1.06\}\ \text{L}$$

Method 2

$$1 = \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{qt} = \%v\{x\}\ \text{qt} * \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{qt} = \frac{\mathbf{\%v\{x\}}}{\mathbf{1.06}}\ \text{L} = \%v\{x/1.06\}\ \text{L}$$

Divide both top and bottom by the unit qt and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} qt = %v{x/1.06} L which rounded to the nearest hundredth is %v{(((x/1.06)*100).round.to_f)/100} L.

Type in %v{(((x/1.06)*100).round.to_f)/100}.

Assistment #60313 "60313 - qt to L"
Convert %v{x} quarts to liters.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

✗ %v{x/1.06}

✓ %v{(((x/1.06)*100).round.to_f)/100}

Scaffold:

Here is a complete explanation:

Lets first think about the situation.

Since quarts are smaller than liters, **there are fewer liters than quarts for the same volume**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from liters to quarts. Since you are going from quarts to liters, divide by the factor.

$$\%v\{x\}\ \text{qt} = \%v\{x\}\ \text{qt} * \frac{1\ \text{L}}{1.06\ \text{qt}} = \frac{\%v\{x\}}{1.06}\ \text{L} = \%v\{x/1.06\}\ \text{L}$$

Method 2

$$1 = \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{qt} = \%v\{x\}\ \text{qt} * \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$\%v\{x\}\ \text{qt} = \frac{\mathbf{\%v\{x\}}}{\mathbf{1.06}}\ \text{L} = \%v\{x/1.06\}\ \text{L}$$

Divide both top and bottom by the unit qt and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} qt = %v{x/1.06} L which rounded to the nearest hundredth is

%v{(((x/1.06)*100).round.to_f)/100} L.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #66274 "66274 - 60189 - qt to L"

Convert 14 quarts to liters.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

✗ 13.2075471698113

✓ 13.21

Hints:

- Lets first think about the situation.

Since quarts are smaller than liters, **there are fewer liters than quarts for the same volume**.

- Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from liters to quarts. Since you are going from quarts to liters, divide by the factor.

$$14 \text{ qt} = 14 \text{ qt} * \frac{1 \text{ L}}{1.06 \text{ qt}} = \frac{14}{1.06} \text{ L} = 13.2075471698113 \text{ L}$$

Method 2

$$1 = \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$14 \text{ qt} = 14 \text{ qt} * \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$14 \text{ qt} = \frac{\mathbf{14}}{} \text{ L} = 13.2075471698113 \text{ L}$$

Divide both top and bottom by the unit qt and simplify.
Just as a number divided by itself is 1, a unit

1.06 divided by itself is 1, which has no units.

Both methods show that 14 qt = 13.2075471698113 L which rounded to the nearest hundredth is 13.21 L.

Type in 13.21.

Assistment #66320 "66320 - 60313 - qt to L"

Convert 31 quarts to liters.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

✗ 29.2452830188679

✓ 29.25

Scaffold:

Here is a complete explanation:

Lets first think about the situation.

Since quarts are smaller than liters, **there are fewer liters than quarts for the same volume**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from liters to quarts. Since you are going from quarts to liters, divide by the factor.

$$31 \text{ qt} = 31 \text{ qt} * \frac{1 \text{ L}}{1.06 \text{ qt}} = \frac{31}{1.06} \text{ L} = 29.2452830188679 \text{ L}$$

Method 2

$$1 = \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

Now multiply the given number by the

$31\ qt = 31\ qt * \frac{\mathbf{1\ L}}{\mathbf{1.06\ qt}}$

conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$31\ qt = \frac{\mathbf{31}}{\mathbf{1.06}}\ L = 29.2452830188679\ L$

Divide both top and bottom by the unit qt and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 31 qt = 29.2452830188679 L which rounded to the nearest hundredth is 29.25 L.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 60188

Convert 28 liters to quarts.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

* Number of liters goes from 2 to 41.

Assistment #60188 "60188 - L to qt"

Convert %v{x} liters to quarts.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

%v{x*1.06}

Hints:

- Lets first think about the situation.

  Since quarts are smaller than liters, **there are more quarts than liters for the same volume**.

- Here will be shown two methods to solve this problem.

  Method 1

  You are given the conversion factor for going from liters to quarts. Since you are going from liters to quarts, divide by the factor.

%v{x} L = %v{x} L * 1.06 $\frac{\text{qt}}{\textbf{L}}$ = %v{x} * 1.06 qt = %v{x*1.06} qt

Method 2

1 = $\frac{\textbf{1.06 qt}}{\textbf{1 L}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} L = %v{x} L * $\frac{\textbf{1.06 qt}}{\textbf{1 L}}$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} L = %v{x} * 1.06 qt = %v{x*1.06} qt

Divide both top and bottom by the unit L and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} L = %v{x*1.06} qt.

Type in %v{(((x*1.06)*100).round.to_f)/100}.

Assistment #60312 "60312 - L to qt"
Convert %v{x} liters to quarts.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

%v{x*1.06}

Scaffold:

Here is a complete explanation:

Lets first think about the situation.

Since quarts are smaller than liters, **there are more quarts than liters for the same volume**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from liters to quarts. Since you are going from liters to quarts, divide by the factor.

%v{x} L = %v{x} L * 1.06 $\frac{\text{qt}}{\textbf{L}}$ = %v{x} * 1.06 qt = %v{x*1.06} qt

Method 2

1 = $\frac{\textbf{1.06 qt}}{\textbf{1 L}}$

Write conversion formula as a fraction by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} L = %v{x} L * $\frac{\textbf{1.06 qt}}{\textbf{1 L}}$

Now multiply the given number by the conversion formula. This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

%v{x} L = %v{x} * 1.06 qt = %v{x*1.06} qt

Divide both top and bottom by the unit L and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} L = %v{x*1.06} qt.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #66256 "66256 - 60188 - L to qt"

Convert 29 liters to quarts.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

30.74

Hints:

- Lets first think about the situation.

Since quarts are smaller than liters, **there are more quarts than liters for the same volume**.

- Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from liters to quarts. Since you are going from liters to quarts, divide by the factor.

$$29\ L = 29\ L * 1.06 \frac{qt}{\mathbf{L}} = 29 * 1.06\ qt = 30.74\ qt$$

Method 2

$$1 = \frac{\mathbf{1.06\ qt}}{\mathbf{1\ L}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$29\ L = 29\ L * \frac{\mathbf{1.06\ qt}}{\mathbf{1\ L}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$29\ L = 29 * 1.06\ qt = 30.74\ qt$$

Divide both top and bottom by the unit L and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 29 L = 30.74 qt.

Type in 30.74.

Assistment #66385 "66385 - 60312 - L to qt"

Convert 28 liters to quarts.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

Algebra:

✓ 29.68

Scaffold:

Here is a complete explanation:

Lets first think about the situation.

Since quarts are smaller than liters, **there are more quarts than liters for the same volume**.

Here will be shown two methods to solve this problem.

Method 1

You are given the conversion factor for going from liters to quarts. Since you are going from liters to quarts, divide by the factor.

$$28\ \text{L} = 28\ \text{L} * 1.06 \frac{\text{qt}}{\textbf{L}} = 28 * 1.06\ \text{qt} = 29.68\ \text{qt}$$

Method 2

$$1 = \frac{\mathbf{1.06\ qt}}{\mathbf{1\ L}}$$

Write conversion formula as a fraction by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$28\ \text{L} = 28\ \text{L} * \frac{\mathbf{1.06\ qt}}{\mathbf{1\ L}}$$

Now multiply the given number by the conversion formula.
This involves multiplying both sides by 1 which keeps the equality unchanged the left hand side remains the same.

$$28\ \text{L} = 28 * 1.06\ \text{qt} = 29.68\ \text{qt}$$

Divide both top and bottom by the unit L and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 28 L = 29.68 qt.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 60191

Convert 15 degrees Celsius to degrees Fahrenheit.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

* Number of C goes from -55 to 104.

Assistment #60191 "60191 - C to F"

Convert %v{x} degrees Celsius to degrees Fahrenheit.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

%v{x*9/5+32}

Hints:

- You are given the formula, so you just need to put the given number into the formula.
  To convert from Celsius to Fahrenheit, place the given number into the given formula.

  F = C * 9/5 + 32

  F = %v{x} * 9/5 + 32
- F = C * 9/5 + 32

$$F = \%v\{x\} * \frac{9}{5} + 32$$

F = %v{x*9/5} + 32

- F = C * 9/5 + 32

$$F = \%v\{x\} * \frac{9}{5} + 32$$

F = %v{x*9/5} + 32

F = %v{x*9/5+32}

Rounding to the nearest hundredth and adding units,
F = %v{(((x*9/5+32)*100).round.to_f)/100} °F

Type in %v{(((x*9/5+32)*100).round.to_f)/100}.

Assistment #61775 "61775 - C to F"
Convert %v{x} degrees Celsius to degrees Fahrenheit.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

%v{x*9/5+32}

Scaffold:

Here is a complete explanation:

You are given the formula, so you just need to put the given number into the formula.
To convert from Celsius to Fahrenheit, place the given number into the given formula.

F = C * 9/5 + 32

F = %v{x} * $\frac{9}{5}$ + 32

F = %v{x*9/5} + 32

F = %v{x*9/5+32}

Rounding to the nearest hundredth and adding units,
F = %v{(((x*9/5+32)*100).round.to_f)/100} °F

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #66305 "66305 - 60191 - C to F"
Convert 10 degrees Celsius to degrees Fahrenheit.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

50

Hints:

- You are given the formula, so you just need to put the given number into the formula.

To convert from Celsius to Fahrenheit, place the given number into the given formula.

F = C * 9/5 + 32

F = 10 * 9/5 + 32

- F = C * 9/5 + 32

$$F = 10 * \frac{9}{5} + 32$$

F = 18 + 32

- F = C * 9/5 + 32

$$F = 10 * \frac{9}{5} + 32$$

F = 18 + 32

F = 50

Rounding to the nearest hundredth and adding units,
F = 50 °F

Type in 50.

Assistment #66408 "66408 - 61775 - C to F"

Convert 35 degrees Celsius to degrees Fahrenheit.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

✓ 95

Scaffold:

Here is a complete explanation:

You are given the formula, so you just need to put the given number into the formula.
To convert from Celsius to Fahrenheit, place the given number into the given formula.

F = C * 9/5 + 32

F = 35 * $\frac{9}{5}$ + 32

F = 63 + 32

F = 95

Rounding to the nearest hundredth and adding units,
F = 95 °F

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 60190

Convert 147 degrees Fahrenheit to degrees Celsius.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

* Number of F goes from -80 to 219.

Assistment #60190 "60190 - F to C"
Convert %v{x} degrees Fahrenheit to degrees Celsius.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

%v{(((x - 32)*500/9).round.to_f)/100}

%v{(x - 32)*5/9}

Hints:

- To convert from Fahrenheit to Celsius, place the given number into the given formula and solve for degrees Celsius.

  F = C * 9/5 + 32

  %v{x} = C * 9/5 + 32
- F = C * 9/5 + 32

%v{x} = C * 9/5 + 32

%v{x} - 32 = C * $\frac{9}{5}$

%v{x - 32} = C * $\frac{9}{5}$

- F = C * 9/5 + 32

  %v{x} = C * 9/5 + 32

%v{x} - 32 = C * $\frac{9}{5}$

%v{x - 32} = C * $\frac{9}{5}$

%v{x - 32} * $\frac{5}{9}$ = C

C = %v{(x-32)*5/9}

Rounding to the nearest hundredth and adding units,
C = %v{(((x-32)*500/9).round.to_f)/100} °C

Type in %v{(((x-32)*500/9).round.to_f)/100}.

Assistment #61774 "61774 - F to C"
Convert %v{x} degrees Fahrenheit to degrees Celsius.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

%v{(((x - 32)*500/9).round.to_f)/100}

%v{(x - 32)*5/9}

Scaffold:

Here is a complete explanation:

To convert from Fahrenheit to Celsius, place the given number into the given formula and solve for degrees Celsius.

* = multiply
F = C * 9/5 + 32

%v{x} = C * 9/5 + 32

%v{x} - 32 = C * $\frac{9}{5}$

%v{x - 32} = C * $\frac{9}{5}$

%v{x - 32} * $\frac{5}{9}$ = C

C = %v{(x-32)*5/9}

Rounding to the nearest hundredth and adding units,
C = %v{(((x-32)*500/9).round.to_f)/100} °C

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #66288 "66288 - 60190 - F to C"

Convert 181 degrees Fahrenheit to degrees Celsius.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

✓ 82.78

✗ 82.7777777777778

Hints:

- To convert from Fahrenheit to Celsius, place the given number into the given formula and solve for degrees Celsius.

  F = C * 9/5 + 32

  181 = C * 9/5 + 32
- F = C * 9/5 + 32

  181 = C * 9/5 + 32

  $181 - 32 = C * \frac{9}{5}$

  $149 = C * \frac{9}{5}$
- F = C * 9/5 + 32

  181 = C * 9/5 + 32

  $181 - 32 = C * \frac{9}{5}$

  $149 = C * \frac{9}{5}$

  $149 * \frac{5}{9} = C$

C = 82.7777777777778

Rounding to the nearest hundredth and adding units,
C = 82.78 °C

Type in 82.78.

Assistment #66352 "66352 - 61774 - F to C"

Convert 123 degrees Fahrenheit to degrees Celsius.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

Algebra:

✓ 50.56

✗ 50.5555555555556

Scaffold:

Here is a complete explanation:

To convert from Fahrenheit to Celsius, place the given number into the given formula and solve for degrees Celsius.

F = C * 9/5 + 32

123 = C * 9/5 + 32

$123 - 32 = C * \frac{9}{5}$

$91 = C * \frac{9}{5}$

$91 * \frac{5}{9} = C$

C = 50.5555555555556

Rounding to the nearest hundredth and adding units,
C = 50.56 °C

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Level 1 Problem Set - Distance	Number of Templates
#8831	8
Number to Master: 5 in-a-row	Number of Attempts: 15 First Day, 15 Subsequent Days

Templates

- 59048

Convert 17 miles to kilometers.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

* Number of miles goes from 2 to 41.

- 59095

Convert 39 kilometers to miles.

Use the conversion formula 1 mi = 1.61 km.

Round to the nearest hundredth.

* Number of kilometers goes from 2 to 41.

- 59096

Convert 2 feet to meters.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

* Number of feet goes from 2 to 41.

- 59093

Convert 16 meters to feet.

Use the conversion formula 1 m = 3.28 ft.

Round to the nearest hundredth.

* Number of meters goes from 2 to 41.

- 60181

Convert 24 yards to meters.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

* Number of yards goes from 2 to 41.

- 60180

Convert 38 meters to yards.

Use the conversion formula 1 m = 1.09 yd.

Round to the nearest hundredth.

* Number of meters goes from 2 to 41.

- 59091

Convert 13 inches to centimeters.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

* Number of inches goes from 2 to 41.

- 57651

Convert 12 centimeters to inches.

Use the conversion formula 1 in = 2.54 cm.

Round to the nearest hundredth.

* Number of centimeters goes from 2 to 41.

Level 2 Problem Set - Non-Distance #8832	Number of Templates 6
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates

- 60186

Convert 12 kilograms to pounds.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

* Number of kilograms goes from 2 to 41.

- ## 60187

Convert 41 pounds to kilograms.

Use the conversion formula 1 kg = 2.20 lb.

Round to the nearest hundredth.

* Number of pounds goes from 2 to 41.

- ## 60189

Convert 25 quarts to liters.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

* Number of quarts goes from 2 to 41.

- ## 60188

Convert 28 liters to quarts.

Use the conversion formula 1 L = 1.06 qt.

Round to the nearest hundredth.

* Number of liters goes from 2 to 41.

- ## 60191

Convert 15 degrees Celsius to degrees Fahrenheit.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

* Number of C goes from -55 to 104.

- ## 60190

Convert 147 degrees Fahrenheit to degrees Celsius.

Use the conversion formula °F = °C * 9/5 + 32.

Round to the nearest hundredth.

* Number of F goes from -80 to 219.

Appendix C: Unit Conversion within a System ASSISTments

Original Content Created by Elizabeth Gould

Skill	Class
Unit Conversion Within a System	6^{th} Grade

Mastery Problem Set #8830	Number of Templates 46
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates
All those below.

Problem Set Level 2.1 – English #8827	Number of Templates 16
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates
All from 1.1, 1.2, 1.3.

Problem Set Level 1.1 – English Distance #8820	Number of Templates 6
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates

- 56763

How many feet are 150 inches?
* Number of feet goes from 1 to 15.5 in half foot steps.

Assistment #56763 "56763 - Conversion: x In to Ft"
How many feet is %v{x} inches?
Algebra:
✓ %v{x/12}
Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 12 in. = 1 ft.

  You are going from inches to feet, so the number of feet will be smaller than %v{x} by a factor of 12.
- Divide the number given by the conversion formula.

%v{x} in = %v{x} in * $\frac{\textbf{1 ft}}{\textbf{12 in}}$ = %v{x/12} ft

Type in %v{x/12}.

Assistment #60256 "60256 - Conversion: x In to Ft"
How many feet is %v{x} inches?
Algebra:
✓ %v{x/12}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 12 in. = 1 ft.

You are going from inches to feet, so the number of feet will be smaller than %v{x} by a factor of 12.

Divide the number given by the conversion formula.

$$\%v\{x\}\ \text{in} = \%v\{x\}\ \text{in} * \frac{\textbf{1 ft}}{\textbf{12 in}} = \%v\{x/12\}\ \text{ft}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64618 "64618 - 56763 - Conversion: x In to F

How many feet is 138 inches?

Algebra:

✓ 11.5

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.

5280 ft. = 1 mi.

8 oz. = 1 cup
2 cup = 1 pint
2 pint = 1 quart
4 quarts = 1 gallon

- The converson rate of interest is: 12 in. = 1 ft.

  You are going from inches to feet, so the number of feet will be smaller than 138 by a factor of 12.
- Divide the number given by the conversion formula.

138 in = 138 in * $\frac{\textbf{1 ft}}{\textbf{12 in}}$ = 11.5 ft

Type in 11.5.

Assistment #64722 "64722 - 60256 - Conversion: x In to Ft

How many feet is 114 inches?

Algebra:

✓ 9.5

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 12 in. = 1 ft.

You are going from inches to feet, so the number of feet will be smaller than 114 by a factor of

12.

Divide the number given by the conversion formula.

114 in = 114 in * $\frac{\textbf{1 ft}}{\textbf{12 in}}$ = 9.5 ft

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 56762

How many inches are in 10 feet?
* Number of feet goes from 2 to 21.

Assistment #56762 "56762 - Conversion: x Ft to In"
How many inches are in %v{x} feet?

Algebra:

✓ %v{12*x}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 12 in. = 1 ft.

  You are going from feet to inches, so the number of inches will be larger than %v{x} by a factor of 12.
- Multiply the number given by the conversion formula.

%v{x} ft = %v{x} ft * 12 $\frac{\textbf{in}}{\quad}$ = %v{x*12} in

ft

Type in %v{12*x}.

Assistment #60255 "60255 - Conversion: x Ft to In"
How many inches are in %v{x} feet?

Algebra:

✓ %v{12*x}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The conversion rate of interest is: 12 in. = 1 ft.

You are going from feet to inches, so the number of inches will be larger than %v{x} by a factor of 12.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * 12\,\frac{\textbf{in}}{\textbf{ft}} = \%v\{x*12\}\ \text{in}$$

Multiple choice:

✓ Ok. I have read the solution and am ready for a new problem.

Assistment #64576 "64576 - 56762 - Conversion: x Ft to In"

How many inches are in 6 feet?

Algebra:

✓ 72

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 12 in. = 1 ft.

  You are going from feet to inches, so the number of inches will be larger than 6 by a factor of 12.
- Multiply the number given by the conversion formula.

$$6\text{ ft} = 6\text{ ft} * 12\frac{\textbf{in}}{\textbf{ft}} = 72\text{ in}$$

Type in 72.

Assistment #64702 "64702 - 60255 - Conversion: x Ft to In

How many inches are in 11 feet?

Algebra:

✓ 132

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.

5280 ft. = 1 mi.	8 oz. = 1 cup
	2 cup = 1 pint
	2 pint = 1 quart
	4 quarts = 1 gallon

The conversion rate of interest is: 12 in. = 1 ft.

You are going from feet to inches, so the number of inches will be larger than 11 by a factor of 12.

$$11 \text{ ft} = 11 \text{ ft} * 12 \frac{\textbf{in}}{\textbf{ft}} = 132 \text{ in}$$

Multiple choice:

✓ Ok. I have read the solution and am ready for a new problem.

- # 56773

How many yards are in 93 feet?

* Number of yards goes from 2 to 36.

Assistment #56773 "56773 - Conversion: x Ft to Yd"

How many yards are in %v{x} feet?

Algebra:

✓ %v{x/3}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 3 ft. = 1 yd.

  Since you are going from feet to yards, the number of yards is smaller than %v{x} by a factor of 3.

- Divide the given number by the conversion formula.

%v{x} ft = %v{x} ft * **1 yd** / **3 ft** = %v{x/3} yds

Type in %v{x/3}.

Assistment #60259 "60259 - Conversion: x Ft to Yd"
How many yards are in %v{x} feet?

Algebra:

✓ %v{x/3}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 3 ft. = 1 yd.

Since you are going from feet to yards, the number of yards is smaller than %v{x} by a factor of 3.

Divide the given number by the conversion formula.

%v{x} ft = %v{x} ft * **1 yd** / **3 ft** = %v{x/3} yds

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64603 "64603 - 56773 - Conversion: x Ft to Yd

How many yards are in 42 feet?

Algebra:

✓ 14

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 3 ft. = 1 yd.

  Since you are going from feet to yards, the number of yards is smaller than 42 by a factor of 3.
- Divide the given number by the conversion formula.

$$42 \text{ ft} = 42 \text{ ft} * \frac{\mathbf{1\ yd}}{\mathbf{3\ ft}} = 14 \text{ yds}$$

Type in 14.

Assistment #64670 "64670 - 60259 - Conversion: x Ft to Yd

How many yards are in 21 feet?

Algebra:

✓ 7

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 3 ft. = 1 yd.

Since you are going from feet to yards, the number of yards is smaller than 21 by a factor of 3.

Divide the given number by the conversion formula.

$$21 \text{ ft} = 21 \text{ ft} * \frac{\textbf{1 yd}}{\textbf{3 ft}} = 7 \text{ yds}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 56774

How many miles are 5280 feet?
You may use the conversion formula 1 ft = 5280 mi.
* Number of miles goes from 1 to 5.5 in half mile steps.

Assistment #56774 "56774 - Conversion: x Ft to Mi"
How many miles are %v{x} ft?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ %v{x/5280}

Hints:

- Use the given conversion formula: 5280 ft. = 1 mi.

  Since you are going from feet to miles, the number of miles is smaller than %v{x} by a factor of 5280.
- Divide the given number by the conversion formula.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * \frac{\mathbf{1\ mi}}{5280\ \text{ft}} = \%v\{x/5280\}\ \text{mi}$$

Type in %v{x/5280}.

Assistment #62169 "62169 - Conversion: x Ft to Mi"
How many miles are %v{x} ft?

You may use the conversion formula 1 ft = 5280 mi.
Algebra:
✓ %v{x/5280}

Scaffold:

Here is a complete explanation:

Use the given conversion formula: 5280 ft. = 1 mi.

Since you are going from feet to miles, the number of miles is smaller than %v{x} by a factor of 5280.

Divide the given number by the conversion formula.

$$\%v\{x\}\ \text{ft} = \%v\{x\}\ \text{ft} * \frac{\mathbf{1\ mi}}{5280\ \text{ft}} = \%v\{x/5280\}\ \text{mi}$$

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64631 "64631 - 56774 - Conversion: x Ft to M
How many miles are 5280 ft?

You may use the conversion formula 1 ft = 5280 mi.
Algebra:
✓ 1

Hints:

- Use the given conversion formula: 5280 ft. = 1 mi.

Since you are going from feet to miles, the number of miles is smaller than 5280 by a factor of 5280.

- Divide the given number by the conversion formula.

$$5280 \text{ ft} = 5280 \text{ ft} * \frac{\mathbf{1\ mi}}{5280 \text{ ft}} = 1 \text{ mi}$$

Type in 1.

Assistment #64706 "64706 - 62169 - Conversion: x Ft to M

How many miles are 7920 ft?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ 1.5

Scaffold:

Here is a complete explanation:

Use the given conversion formula: 5280 ft. = 1 mi.

Since you are going from feet to miles, the number of miles is smaller than 7920 by a factor of 5280.

Divide the given number by the conversion formula.

$$7920 \text{ ft} = 7920 \text{ ft} * \frac{\mathbf{1\ mi}}{5280 \text{ ft}} = 1.5 \text{ mi}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 56764

How many feet are in 23 yards?

* Number of yards goes from 2 to 36.

Assistment #56764 "56764 - Conversion: x Yd to Ft"
How many feet are in %v{x} yards?

Algebra:

✓ %v{3*x}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 3 ft = 1 yd.

  You are going from yards to feet, so the number of feet will be larger than %v{x} by a factor of 3.
- Multiply the given number by the conversion formula.

%v{x} yds = %v{x} yds * 3 $\frac{\textbf{ft}}{\textbf{yd}}$ = %v{x*3} ft

Type in %v{x*3}.

Assistment #60257 "60257 - Conversion: x Yd to Ft"
How many feet are in %v{x} yards?

Algebra:

✓ %v{3*x}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 3 ft = 1 yd.

You are going from yards to feet, so the number of feet will be larger than %v{x} by a factor of 3.

Multiply the given number by the conversion formula.

%v{x} yds = %v{x} yds * 3 $\frac{\textbf{ft}}{\textbf{yd}}$ = %v{x*3} ft

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64650 "64650 - 56764 - Conversion: x Yd to Ft

How many feet are in 19 yards?

Algebra:

✓ 57

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 3 ft = 1 yd.

  You are going from yards to feet, so the number of feet will be larger than 19 by a factor of

3.

- Multiply the given number by the conversion formula.

$$19 \text{ yds} = 19 \text{ yds} * 3 \frac{\textbf{ft}}{\textbf{yd}} = 57 \text{ ft}$$

Type in 57.

Assistment #64749 "64749 - 60257 - Conversion: x Yd to Ft

How many feet are in 12 yards?

Algebra:

✓ 36

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 3 ft = 1 yd.

You are going from yards to feet, so the number of feet will be larger than 12 by a factor of 3.

Multiply the given number by the conversion formula.

$$12 \text{ yds} = 12 \text{ yds} * 3 \frac{\textbf{ft}}{\textbf{yd}} = 36 \text{ ft}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 56765

How many feet are in 5 miles?
You may use the conversion formula 1 ft = 5280 mi.
* Number of miles goes from 2 to 6.

Assistment #56765 "56765 - Conversion: x Mi to Ft"
How many feet are in %v{x} miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ %v{5280*x}

Hints:

- Use the given conversion formula: 5280 ft = 1 mi.

  You are going from miles to feet, so the number of feet will be larger than %v{x} by a factor of 5280.
- Multiply the given number by the conversion formula.

%v{x} mi = %v{x} mi * 5280 $\frac{\textbf{ft}}{\textbf{mi}}$ = %v{x*5280} ft

Type in %v{x*5280}.

Assistment #62168 "62168 - Conversion: x Mi to Ft"
How many feet are in %v{x} miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ %v{5280*x}

Scaffold:

Here is a complete explanation:

Use the given conversion formula: 5280 ft = 1 mi.

You are going from miles to feet, so the number of feet will be larger than %v{x} by a factor of 5280.

Multiply the given number by the conversion formula.

$\%v\{x\}\ mi = \%v\{x\}\ mi * 5280 \frac{\mathbf{ft}}{\mathbf{mi}} = \%v\{x*5280\}\ ft$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64560 "64560 - 56765 - Conversion: x Mi to Ft"

How many feet are in 5 miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ 26400

Hints:

- Use the given conversion formula: 5280 ft = 1 mi.

  You are going from miles to feet, so the number of feet will be larger than 5 by a factor of 5280.
- Multiply the given number by the conversion formula.

$5\ mi = 5\ mi * 5280 \frac{\mathbf{ft}}{\mathbf{mi}} = 26400\ ft$

Type in 26400.

Assistment #64687 "64687 - 62168 - Conversion: x Mi to F

How many feet are in 4 miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ 21120

Scaffold:

Here is a complete explanation:

Use the given conversion formula: 5280 ft = 1 mi.

You are going from miles to feet, so the number of feet will be larger than 4 by a factor of 5280.

Multiply the given number by the conversion formula.

$$4\text{ mi} = 4\text{ mi} * 5280\,\frac{\textbf{ft}}{\textbf{mi}} = 21120\text{ ft}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level 1.2 – English Volume #8821	Number of Templates 8
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates

- 57296

How many ounces are in 6 cups?
* Number of cups goes from 2 to 13.

Assistment #57296 "57296 - Conversion: x Cup to Oz"
How many ounces are in %v{x} cups?

Algebra:

✓ %v{x*8}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

<u>Distance</u> <u>Mass</u> <u>Volume</u>

12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 8 oz = 1 cup.

  Since you are going from cups to ounces, the number of ounces is greater than %v{x} by a factor of 8.
- Multiply the given number by the conversion formula.

$$\%v\{x\}\text{ cups} = \%v\{x\}\text{ cups} * 8\,\frac{\textbf{oz}}{\textbf{cup}} = \%v\{x*8\}\text{ oz}$$

Type in %v{x*8}.

Assistment #60261 "60261 - Conversion: x Cup to Oz"
How many ounces are in %v{x} cups?

Algebra:

✓ %v{x*8}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 8 oz = 1 cup.

Since you are going from cups to ounces, the number of ounces is greater than %v{x} by a factor of 8.

Multiply the given number by the conversion formula.

%v{x} cups = %v{x} cups * 8 $\frac{\textbf{oz}}{\textbf{cup}}$ = %v{x*8} oz

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64791 "64791 - 57296 - Conversion: x Cup to Oz"

How many ounces are in 12 cups?

Algebra:

✓ 96

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 8 oz = 1 cup.

  Since you are going from cups to ounces, the number of ounces is greater than 12 by a factor of 8.
- Multiply the given number by the conversion formula.

12 cups = 12 cups * 8 $\frac{\textbf{oz}}{\textbf{cup}}$ = 96 oz

Type in 96.

Assistment #64901 "64901 - 60261 - Conversion: x Cup to Oz"

How many ounces are in 11 cups?

Algebra:

✓ 88

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 8 oz = 1 cup.

Since you are going from cups to ounces, the number of ounces is greater than 11 by a factor of 8.

Multiply the given number by the conversion formula.

11 cups = 11 cups * 8 $\frac{\textbf{oz}}{\textbf{cup}}$ = 88 oz

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57297

How many cups are in 5 pints?

* Number of pints goes from 2 to 36.

Assistment #57297 "57297 - Conversion: x Pint to Cup"

How many cups are in %v{x} pints?

Algebra:

✓ %v{x*2}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 cups = 1 pint.

  You are going from pints to cups, so the number of cups is greater than %v{x} by a factor of 2.
- Multiply the given number by the conversion formula.

%v{x} pints = %v{x} pints * 2 $\frac{\textbf{cups}}{\textbf{pint}}$ = %v{x*2} cups

Type in %v{x*2}.

Assistment #60262 "60262 - Conversion: x Pint to Cup"
How many cups are in %v{x} pints?
Algebra:
✓ %v{x*2}
Scaffold:
Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart

4 quarts = 1 gallon

The converson rate of interest is 2 cups = 1 pint.

You are going from pints to cups, so the number of cups is greater than %v{x} by a factor of 2.

Multiply the given number by the conversion formula.

%v{x} pints = %v{x} pints * 2 $\frac{\textbf{cups}}{\textbf{pint}}$ = %v{x*2} cups

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64815 "64815 - 57297 - Conversion: x Pint to Cup"

How many cups are in 25 pints?

Algebra:

✓ 50

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 cups = 1 pint.

  You are going from pints to cups, so the number of cups is greater than 25 by a factor of 2.
- Multiply the given number by the conversion formula.

25 pints = 25 pints * 2 $\frac{\textbf{cups}}{\textbf{pint}}$ = 50 cups

Type in 50.

Assistment #64927 "64927 - 60262 - Conversion: x Pint to Cup"

How many cups are in 22 pints?

Algebra:

✓ 44

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 2 cups = 1 pint.

You are going from pints to cups, so the number of cups is greater than 22 by a factor of 2.

Multiply the given number by the conversion formula.

$22 \text{ pints} = 22 \text{ pints} * 2 \frac{\textbf{cups}}{\textbf{pint}} = 44 \text{ cups}$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57298

How many pints are in 12 quarts?

* Number of quarts goes from 2 to 36.

Assistment #57298 "57298 - Conversion: x Quart to Pint"

How many pints are in %v{x} quarts?

Algebra:

✓ %v{x*2}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 pint = 1 quart.

  You are going from quarts to pints, so the number of pints is greater than %v{x} by a factor of 2.
- Multiply the given number by the conversion formula.

%v{x} quarts = %v{x} quarts * 2 $\frac{\textbf{pints}}{\textbf{quart}}$ = %v{x*2} pints

Type in %v{x*2}.

Assistment #60263 "60263 - Conversion: x Quart to Pint"

How many pints are in %v{x} quarts?

Algebra:

✓ %v{x*2}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup

2 cup = 1 pint
2 pint = 1 quart
4 quarts = 1 gallon

The converson rate of interest is 2 pint = 1 quart.

You are going from quarts to pints, so the number of pints is greater than %v{x} by a factor of 2.

Multiply the given number by the conversion formula.

%v{x} quarts = %v{x} quarts * 2 $\frac{\textbf{pints}}{\textbf{quart}}$ = %v{x*2} pints

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64838 "64838 - 57298 - Conversion: x Quart to Pint"

How many pints are in 5 quarts?

Algebra:

✓ 10

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 pint = 1 quart.

You are going from quarts to pints, so the number of pints is greater than 5 by a factor of 2.

- Multiply the given number by the conversion formula.

5 quarts = 5 quarts * 2 $\frac{\textbf{pints}}{\textbf{quart}}$ = 10 pints

Type in 10.

Assistment #64854 "64854 - 60263 - Conversion: x Quart to Pint"

How many pints are in 5 quarts?

Algebra:

✓ 10

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 2 pint = 1 quart.

You are going from quarts to pints, so the number of pints is greater than 5 by a factor of 2.

Multiply the given number by the conversion formula.

5 quarts = 5 quarts * 2 $\frac{\textbf{pints}}{\textbf{quart}}$ = 10 pints

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57299

How many quarts are in 8 gallons?

* Number of gallons goes from 2 to 21.

Assistment #57299 "57299 - Conversion: x Gallon to Quart"

How many quarts are in %v{x} gallons?

Algebra:

✓ %v{x*4}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 4 quart = 1 gallon.

  You are going from gallons to quarts, so the number of quarts is greater than %v{x} by a factor of 4.
- Multiply the given number by the conversion formula.

%v{x} gallons = %v{x} gallons * 4 $\frac{\textbf{quarts}}{\textbf{gallon}}$ = %v{x*4} quarts

Type in %v{x*4}.

Assistment #60264 "60264 - Conversion: x Gallon to Quart"

How many quarts are in %v{x} gallons?

Algebra:

✓ %v{x*4}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup

2 cup = 1 pint
2 pint = 1 quart
4 quarts = 1 gallon

The converson rate of interest is 4 quart = 1 gallon.

You are going from gallons to quarts, so the number of quarts is greater than %v{x} by a factor of 4.

Multiply the given number by the conversion formula.

%v{x} gallons = %v{x} gallons * 4 $\frac{\textbf{quarts}}{\textbf{gallon}}$ = %v{x*4} quarts

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64765 "64765 - 57299 - Conversion: x Gallon to Quart"

How many quarts are in 19 gallons?

Algebra:

✓ 76

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 4 quart = 1 gallon.

  You are going from gallons to quarts, so the number of quarts is greater than 19 by a factor of 4.
- Multiply the given number by the conversion formula.

19 gallons = 19 gallons * 4 $\frac{\textbf{quarts}}{\textbf{gallon}}$ = 76 quarts

Type in 76.

Assistment #64865 "64865 - 60264 - Conversion: x Gallon to Quart"

How many quarts are in 3 gallons?

Algebra:

✓ 12

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 4 quart = 1 gallon.

You are going from gallons to quarts, so the number of quarts is greater than 3 by a factor of 4.

Multiply the given number by the conversion formula.

3 gallons = 3 gallons * 4 $\frac{\textbf{quarts}}{\textbf{gallon}}$ = 12 quarts

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57521

How many cups are 56 ounces?

* Number of cups goes from 2 to 13.

Assistment #57521 "57521 - Conversion: x Oz to Cup"
How many cups are in %v{x} ounces?

Algebra:

✓ %v{x/8}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 8 oz = 1 cup.

  Since you are going from ounces to cups, the number of cups is smaller than %v{x} by a factor of 8.
- Multiply the given number by the conversion formula.

%v{x} oz = %v{x} oz * $\frac{\textbf{1 cup}}{\textbf{8 oz}}$ = %v{x/8} cups

Type in %v{x/8}.

Assistment #60265 "60265 - Conversion: x Oz to Cup"
How many cups are in %v{x} ounces?

Algebra:

✓ %v{x/8}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 8 oz = 1 cup.

Since you are going from ounces to cups, the number of cups is smaller than %v{x} by a factor of 8.

Multiply the given number by the conversion formula.

$$\%v\{x\}\text{ oz} = \%v\{x\}\text{ oz} * \frac{\textbf{1 cup}}{\textbf{8 oz}} = \%v\{x/8\}\text{ cups}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64778 "64778 - 57521 - Conversion: x Oz to Cup"

How many cups are in 64 ounces?

Algebra:

✓ 8

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 8 oz = 1 cup.

Since you are going from ounces to cups, the number of cups is smaller than 64 by a factor of 8.

- Multiply the given number by the conversion formula.

$$64 \text{ oz} = 64 \text{ oz} * \frac{\mathbf{1\ cup}}{\mathbf{8\ oz}} = 8 \text{ cups}$$

Type in 8.

Assessment #64878 "64878 - 60265 - Conversion: x Oz to Cup"

How many cups are in 80 ounces?

Algebra:

✓ 10

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 8 oz = 1 cup.

Since you are going from ounces to cups, the number of cups is smaller than 80 by a factor of 8.

Multiply the given number by the conversion formula.

$$80 \text{ oz} = 80 \text{ oz} * \frac{\mathbf{1\ cup}}{\mathbf{8\ oz}} = 10 \text{ cups}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57522

How many pints are 42 cups?
* Number of pints goes from 2 to 36.

Assistment #57522 "57522 - Conversion: x Cup to Pint"
How many pints are %v{x} cups?
Algebra:
✓ %v{x/2}
Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 cups = 1 pint.

  You are going from cups to pints, so the number of pints is smaller than %v{x} by a factor of 2.
- Multiply the given number by the conversion formula.

%v{x} cups = %v{x} cups * $\frac{\textbf{1 pint}}{\textbf{2 cups}}$ = %v{x/2} pints

Type in %v{x/2}.

Assistment #60266 "60266 - Conversion: x Cup to Pint"
How many pints are %v{x} cups?
Algebra:
✓ %v{x/2}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 2 cups = 1 pint.

You are going from cups to pints, so the number of pints is smaller than %v{x} by a factor of 2.

Multiply the given number by the conversion formula.

$$\%v\{x\}\ \text{cups} = \%v\{x\}\ \text{cups} * \frac{\textbf{1 pint}}{\textbf{2 cups}} = \%v\{x/2\}\ \text{pints}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64801 "64801 - 57522 - Conversion: x Cup to Pint"

How many pints are 16 cups?

Algebra:

✓ 8

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup

2 cup = 1 pint
2 pint = 1 quart
4 quarts = 1 gallon

- The converson rate of interest is 2 cups = 1 pint.

  You are going from cups to pints, so the number of pints is smaller than 16 by a factor of 2.
- Multiply the given number by the conversion formula.

16 cups = 16 cups * $\frac{\textbf{1 pint}}{\textbf{2 cups}}$ = 8 pints

Type in 8.

Assistment #64897 "64897 - 60266 - Conversion: x Cup to Pint"

How many pints are 40 cups?

Algebra:

✓ 20

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 2 cups = 1 pint.

You are going from cups to pints, so the number of pints is smaller than 40 by a factor of 2.

Multiply the given number by the conversion formula.

40 cups = 40 cups * **1 pint** = 20 pints

2 cups

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57523

How many quarts are 36 pints?
* Number of quarts goes from 2 to 36.

Assistment #57523 "57523 - Conversion: x Pint to Quart"
How many quarts are %v{x} pints?

Algebra:

✓ %v{x/2}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 pint = 1 quart.

  You are going from pints to quarts, so the number of quarts is smaller than %v{x} by a factor of 2.
- Multiply the given number by the conversion formula.

%v{x} pints = %v{x} pints * $\frac{\textbf{1 quart}}{\textbf{2 pints}}$ = %v{x/2} quarts

Type in %v{x/2}.

Assistment #60267 "60267 - Conversion: x Pint to Quart"

How many quarts are %v{x} pints?

Algebra:

✓ %v{x/2}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 2 pint = 1 quart.

You are going from pints to quarts, so the number of quarts is smaller than %v{x} by a factor of 2.

Multiply the given number by the conversion formula.

%v{x} pints = %v{x} pints * **1 quart** / **2 pints** = %v{x/2} quarts

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64827 "64827 - 57523 - Conversion: x Pint to Quart"

How many quarts are 38 pints?

Algebra:

✓ 19

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 2 pint = 1 quart.

  You are going from pints to quarts, so the number of quarts is smaller than 38 by a factor of 2.
- Multiply the given number by the conversion formula.

$$38 \text{ pints} = 38 \text{ pints} * \frac{\textbf{1 quart}}{\textbf{2 pints}} = 19 \text{ quarts}$$

Type in 19.

Assistment #64915 "64915 - 60267 - Conversion: x Pint to Quart"

How many quarts are 44 pints?

Algebra:

✓ 22

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 2 pint = 1 quart.

You are going from pints to quarts, so the number of quarts is smaller than 44 by a factor of 2.

Multiply the given number by the conversion formula.

44 pints = 44 pints * $\frac{\textbf{1 quart}}{\textbf{2 pints}}$ = 22 quarts

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57524

How many gallons are 16 quarts?
* Number of gallons goes from 2 to 21.

Assistment #57524 "57524 - Conversion: x Quart to Gallon"
How many gallons are %v{x} quarts?

Algebra:

✓ %v{x/4}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 4 quart = 1 gallon.

  You are going from quarts to gallons, so the number of gallons is smaller than %v{x} by a factor of 4.
- Multiply the given number by the conversion formula.

%v{x} quarts = %v{x} quarts * $\frac{\textbf{1 gallon}}{}$ = %v{x/4} gallons

4 quarts

Type in %v{x/4}.

Assistment #60268 "60268 - Conversion: x Quart to Gallon"
How many gallons are %v{x} quarts?
Algebra:
✓ %v{x/4}
Scaffold:
Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 4 quart = 1 gallon.

You are going from quarts to gallons, so the number of gallons is smaller than %v{x} by a factor of 4.

Multiply the given number by the conversion formula.

%v{x} quarts = %v{x} quarts * $\frac{\textbf{1 gallon}}{\textbf{4 quarts}}$ = %v{x/4} gallons

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64753 "64753 - 57524 - Conversion: x Quart to Gallon"
How many gallons are 28 quarts?
Algebra:

✓ 7

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is 4 quart = 1 gallon.

  You are going from quarts to gallons, so the number of gallons is smaller than 28 by a factor of 4.
- Multiply the given number by the conversion formula.

$$28 \text{ quarts} = 28 \text{ quarts} * \frac{\mathbf{1\ gallon}}{\mathbf{4\ quarts}} = 7 \text{ gallons}$$

Type in 7.

Assistment #64945 "64945 - 60268 - Conversion: x Quart to Gallon"

How many gallons are 72 quarts?

Algebra:

✓ 18

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup

		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is 4 quart = 1 gallon.

You are going from quarts to gallons, so the number of gallons is smaller than 72 by a factor of 4.

Multiply the given number by the conversion formula.

72 quarts = 72 quarts * $\frac{\textbf{1 gallon}}{\textbf{4 quarts}}$ = 18 gallons

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level – 1.3 English Mass #8785	Number of Templates 2
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates

- 56772

How many ounces are in 7 pounds?

* Number of pounds goes from 2 to 19.

Assistment #56772 "56772 - Conversion: x Lb to Oz"

How many ounces are in %v{x} pounds?

Algebra:

✓ %v{16*x}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

<u>Distance</u> <u>Mass</u> <u>Volume</u>

12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

  Since you are going from pounds to ounces, the number of ounces will be larger than %v{x} by a factor of 16.
- Multiply the given number by the conversion formula.

%v{x} lbs = %v{x} lbs * 16 $\frac{\textbf{oz}}{\text{lb}}$ = %v{x*16} oz

Type in %v{16*x}.

Assistment #60258 "60258 - Conversion: x Lb to Oz"
How many ounces are in %v{x} pounds?

Algebra:

✓ %v{16*x}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

Since you are going from pounds to ounces, the number of ounces will be larger than %v{x} by a factor of 16.

Multiply the given number by the conversion formula.

$$\%v\{x\}\ \text{lbs} = \%v\{x\}\ \text{lbs} * 16\,\frac{\textbf{oz}}{\text{lb}} = \%v\{x*16\}\ \text{oz}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64474 "64474 - 56772 - Conversion: x Lb to Oz

How many ounces are in 4 pounds?

Algebra:

✓ 64

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

  Since you are going from pounds to ounces, the number of ounces will be larger than 4 by a factor of 16.
- Multiply the given number by the conversion formula.

$$4\ \text{lbs} = 4\ \text{lbs} * 16\,\frac{\textbf{oz}}{\text{lb}} = 64\ \text{oz}$$

Type in 64.

Assistment #64522 "64522 - 60258 - Conversion: x Lb to Oz
How many ounces are in 16 pounds?

Algebra:

✓ 256

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

Since you are going from pounds to ounces, the number of ounces will be larger than 16 by a factor of 16.

Multiply the given number by the conversion formula.

16 lbs = 16 lbs * 16 $\frac{\textbf{oz}}{\text{lb}}$ = 256 oz

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 56790

How many pounds are 24 ounces?
* Number of pounds goes from 1 to 10.5 in half pound steps.

Assistment #56790 "56790 - Conversion: x Oz to Lb"
How many pounds are %v{x} ounces?

Algebra:

✓ %v{x/16}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

  Since you are going from ounces to pounds, the number of pounds is going to be smaller than %v{x} by a factor of 16.
- Divide the given number by the conversion formula.

%v{x} oz = %v{x} oz * **1 lb** / **16 oz** = %v{x/16} lbs

Type in %v{x/16}.

Assistment #60260 "60260 - Conversion: x Oz to Lb"
How many pounds are %v{x} ounces?

Algebra:

✓ %v{x/16}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.

5280 ft. = 1 mi.	8 oz. = 1 cup
	2 cup = 1 pint
	2 pint = 1 quart
	4 quarts = 1 gallon

The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

Since you are going from ounces to pounds, the number of pounds is going to be smaller than %v{x} by a factor of 16.

Divide the given number by the conversion formula.

%v{x} oz = %v{x} oz * $\frac{\textbf{1 lb}}{\textbf{16 oz}}$ = %v{x/16} lbs

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #64499 "64499 - 56790 - Conversion: x Oz to Lb'

How many pounds are 64 ounces?

Algebra:

4

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

  Since you are going from ounces to pounds, the number of pounds is going to be smaller than 64 by a factor of 16.
- Divide the given number by the conversion formula.

64 oz = 64 oz * $\frac{\textbf{1 lb}}{\textbf{16 oz}}$ = 4 lbs

Type in 4.

Assistment #64552 "64552 - 60260 - Conversion: x Oz to Lb
How many pounds are 160 ounces?

Algebra:

✓ 10

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

The converson rate of interest is: 16 oz = 1 lb. (lb is the abbreviation for pound.)

Since you are going from ounces to pounds, the number of pounds is going to be smaller than 160 by a factor of 16.

Divide the given number by the conversion formula.

160 oz = 160 oz * $\frac{\textbf{1 lb}}{\textbf{16 oz}}$ = 10 lbs

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level 2.2 – Metric	Number of Templates
#8828	16
Number to Master	Number of Attempts
5 in-a-row	15 First Day, 15 Subsequent Days

Templates
All from 1.4, 1.5, 1.6.

Problem Set Level 1.4 – Metric Distance	Number of Templates
#8822	8
Number to Master	Number of Attempts
5 in-a-row	15 First Day, 15 Subsequent Days

Templates

- ## 57525

How many millimeters are in 109 centimeters?
* Number of millimeters goes from 2 to 151.

Assistment #57525 "57525 - Conversion: x cm to mm"
How many millimeters are in %v{x} centimeters?
Algebra:
%v{x*10}
Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
hm = 100 m
dam = 10 m

↓

m = 1 m

↓

dm = 0.1 m

↓

cm = 0.01 m

↓

mm = 0.001 m

↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	K	10^{3}	thousand
hecto-	H	10^{2}	hundred
deka-	Da	10^{1}	ten
--------	--------	10^{0}	one
deci-	D	10^{-1}	tenth
centi-	C	10^{-2}	hundredth
milli-	M	10^{-3}	thousandth
micro-	M	10^{-6}	millionth
nano-	N	10^{-9}	billionth
pico-	P	10^{-12}	trillionth

- From cm to mm is one step down, so the number of mm is 10 times larger than the number of cm.
- Multiply the number given by 10 or 10^{1}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 1 power of ten, move the decimal point over 1 place to the right.

%v{x} cm = %v{x*10} mm

Type in %v{x*10}.

Assistment #60269 "60269 - Conversion: x cm to mm"
How many millimeters are in %v{x} centimeters?

Algebra:

✓ %v{x*10}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
↓
hm = 100 m
↓
dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	K	10^{3}	thousand
hecto-	H	10^{2}	hundred
deka-	Da	10^{1}	ten
--------	--------	10^{0}	one
deci-	D	10^{-1}	tenth
centi-	C	10^{-2}	hundredth
milli-	M	10^{-3}	thousandth
micro-	M	10^{-6}	millionth
nano-	N	10^{-9}	billionth
pico-	P	10^{-12}	trillionth

From cm to mm is one step down, so the number of mm is 10 times larger than the number of cm.

Multiply the number given by 10 or 10^{1}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 1 power of ten, move the decimal point over 1 place to the right.

%v{x} cm = %v{x*10} mm

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64969 "64969 - 57525 - Conversion: x cm to mm"

How many millimeters are in 112 centimeters?

Algebra:

✓ 1120

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |

hm = 100 m |

dam = 10 m |

m = 1 m |

dm = 0.1 m |

cm = 0.01 m |

mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	K	10^{3}	thousand
hecto-	H	10^{2}	hundred
deka-	Da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From cm to mm is one step down, so the number of mm is 10 times larger than the number of cm.
- Multiply the number given by 10 or 10^{1}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 1 power of ten, move the decimal point over 1 place to the right.

112 cm = 1120 mm

Type in 1120.

Assistment #65054 "65054 - 60269 - Conversion: x cm to mm"

How many millimeters are in 21 centimeters?

Algebra:

210

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |
hm = 100 m |
dam = 10 m |
m = 1 m |
dm = 0.1 m |
cm = 0.01 m |
mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From cm to mm is one step down, so the number of mm is 10 times larger than the number of cm.

Multiply the number given by 10 or 10^{1}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 1 power of ten, move the decimal point over 1 place to the right.

21 cm = 210 mm

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

- 57587

How many centimeters are in 374 millimeters?

* Number of millimeters goes from 12 to 511.

Assistment #57587 "57587 - Conversion: x mm to cm"

How many centimeters are in %v{x} millimeters?

Algebra:

%v{x/10}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m

hm = 100 m

dam = 10 m

m = 1 m

dm = 0.1 m

cm = 0.01 m

mm = 0.001 m

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mm to cm is one step up, so the number of cm is 1/10, 0.1 or 10^{-1} times the number of mm.
- Divide the number given by 10 or multiply it by $10^{-1} = 1/10^{1}$.

  When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -1 power of ten, move the decimal point over 1 place to the left.

  %v{x} mm = %v{x/10} cm

  Type in %v{x/10}.

Assistment #60278 "60278 - Conversion: x mm to cm"
How many centimeters are in %v{x} millimeters?

Algebra:

✓ %v{x/10}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
↓
hm = 100 m
↓
dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth

milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From mm to cm is one step up, so the number of cm is 1/10, 0.1 or 10^{-1} times the number of mm.

Divide the number given by 10 or multiply it by $10^{-1} = 1/10^{1}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -1 power of ten, move the decimal point over 1 place to the left.

%v{x} mm = %v{x/10} cm

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #64991 "64991 - 57587 - Conversion: x mm to cm"

How many centimeters are in 208 millimeters?

Algebra:

20.8

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |
hm = 100 m |
dam = 10 m |
m = 1 m |
dm = 0.1 m |
cm = 0.01 m |
mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mm to cm is one step up, so the number of cm is 1/10, 0.1 or 10^{-1} times the number of mm.
- Divide the number given by 10 or multiply it by $10^{-1} = 1/10^{1}$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -1 power of ten, move the decimal point over 1 place to the left.

208 mm = 20.8 cm

Type in 20.8.

Assistment #65115 "65115 - 60278 - Conversion: x mm to cm"

How many centimeters are in 58 millimeters?

Algebra:

✓ 5.8

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
hm = 100 m
dam = 10 m
m = 1 m

dm = 0.1 m |

cm = 0.01 m |

mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From mm to cm is one step up, so the number of cm is 1/10, 0.1 or 10^{-1} times the number of mm.

Divide the number given by 10 or multiply it by $10^{-1} = 1/10^{1}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -1 power of ten, move the decimal point over 1 place to the left.

58 mm = 5.8 cm

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57526

How many centimeters are in 4 meters?
* Number of meters goes from 2 to 21.

Assistment #57526 "57526 - Conversion: x m to cm"
How many centimeters are in %v{x} meters?

Algebra:

%v{x*100}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m ↓

hm = 100 m ↓

dam = 10 m ↓

m = 1 m ↓

dm = 0.1 m ↓

cm = 0.01 m ↓

mm = 0.001 m ↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand

hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From m to cm is two steps down, so the number of centimeters is 100 or 10^{2} times larger than the number of meters.
- Multiply the number given by 100 or 10^{2}.

  When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 2 powers of ten, move the decimal point over 2 places to the right.

  %v{x} m = %v{x*100} cm

  Type in %v{x*100}.

Assistment #60270 "60270 - Conversion: x m to cm"
How many centimeters are in %v{x} meters?

Algebra:

%v{x*100}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
↓
hm = 100 m
↓
dam = 10 m
↓
m = 1 m

dm = 0.1 m

cm = 0.01 m

mm = 0.001 m

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From m to cm is two steps down, so the number of centimeters is 100 or 10^2 times larger than the number of meters.

Multiply the number given by 100 or 10^2.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 2 powers of ten, move the decimal point over 2 places to the right.

%v{x} m = %v{x*100} cm

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64970 "64970 - 57526 - Conversion: x m to cm"

How many centimeters are in 20 meters?

Algebra:

✓ 2000

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |

hm = 100 m |

dam = 10 m |

m = 1 m |

dm = 0.1 m |

cm = 0.01 m |

mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred

deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From m to cm is two steps down, so the number of centimeters is 100 or 10^2 times larger than the number of meters.
- Multiply the number given by 100 or 10^2.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 2 powers of ten, move the decimal point over 2 places to the right.

20 m = 2000 cm

Type in 2000.

Assistment #65079 "65079 - 60270 - Conversion: x m to cm"

How many centimeters are in 21 meters?

Algebra:

✓ 2100

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						km = 1000 m
					hm = 100 m	
				dam = 10 m		
			m = 1 m			
		dm = 0.1 m				
	cm = 0.01 m					
mm = 0.001 m						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
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giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From m to cm is two steps down, so the number of centimeters is 100 or 10^2 times larger than the number of meters.

Multiply the number given by 100 or 10^2.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 2 powers of ten, move the decimal point over 2 places to the right.

21 m = 2100 cm

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57588

How many meters are 339 centimeters?

* Number of centimeters goes from 110 to 1609.

Assistment #57588 "57588 - Conversion: x cm to m"

How many meters are %v{x} centimeters?

Algebra:

%v{x/100}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m

hm = 100 m

dam = 10 m

m = 1 m

dm = 0.1 m

cm = 0.01 m

mm = 0.001 m

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth

milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From cm to m is two steps up, so the number of meters is 1/100, 0.01 or 10^{-2} times the number of centimeters.
- Divide the number given by 100 or multiply it by $10^{-2} = 1/10^{2}$.

  When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -2 powers of ten, move the decimal point over 2 places to the left.

  %v{x} cm = %v{x/100} m

  Type in %v{x/100}.

Assistment #60279 "60279 - Conversion: x cm to m"
How many meters are %v{x} centimeters?

Algebra:

%v{x/100}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m

hm = 100 m

dam = 10 m

m = 1 m

dm = 0.1 m

cm = 0.01 m

mm = 0.001 m

↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From cm to m is two steps up, so the number of meters is 1/100, 0.01 or 10^{-2} times the number of centimeters.

Divide the number given by 100 or multiply it by $10^{-2} = 1/10^{2}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -2 powers of ten, move the decimal point over 2 places to the left.

%v{x} cm = %v{x/100} m

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assessment #65006 "65006 - 57588 - Conversion: x cm to m"

How many meters are 375 centimeters?

Algebra:

✓ 3.75

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |

hm = 100 m |

dam = 10 m |

m = 1 m |

dm = 0.1 m |

cm = 0.01 m |

mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth

pico-	p	10^{-12}	trillionth

- From cm to m is two steps up, so the number of meters is 1/100, 0.01 or 10^{-2} times the number of centimeters.
- Divide the number given by 100 or multiply it by $10^{-2} = 1/10^{2}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -2 powers of ten, move the decimal point over 2 places to the left.

375 cm = 3.75 m

Type in 3.75.

Assistment #65127 "65127 - 60279 - Conversion: x cm to m"

How many meters are 855 centimeters?

Algebra:

✓ 8.55

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |
hm = 100 m |
dam = 10 m |
m = 1 m |
dm = 0.1 m |
cm = 0.01 m |
mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion

mega-	M	10^6	million
kilo-	k	10^3	thousand
hecto-	h	10^2	hundred
deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From cm to m is two steps up, so the number of meters is 1/100, 0.01 or 10^{-2} times the number of centimeters.

Divide the number given by 100 or multiply it by $10^{-2} = 1/10^2$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -2 powers of ten, move the decimal point over 2 places to the left.

855 cm = 8.55 m

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57527

How many meters are in 13 kilometers?

* Number of kilometers goes from 2 to 16.

Assistment #57527 "57527 - Conversion: x km to m"

How many meters are in %v{x} kilometers?

Algebra:

✓ %v{x*1000}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m

hm = 100 m

dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From km to m is three steps down, so the number of meters is 1000 or 10^3 times the number of kilometers.
- Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

%v{x} km = %v{x*1000} m

Type in %v{x*1000}.

Assistment #60271 "60271 - Conversion: x km to m"
How many meters are in %v{x} kilometers?

Algebra:

✓ %v{x*1000}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
↓
hm = 100 m
↓
dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From km to m is three steps down, so the number of meters is 1000 or 10^3 times the number of kilometers.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

%v{x} km = %v{x*1000} m

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assessment #64995 "64995 - 57527 - Conversion: x km to m"

How many meters are in 9 kilometers?

Algebra:

✓ 9000

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						km = 1000 m
					hm = 100 m	
				dam = 10 m		
			m = 1 m			
		dm = 0.1 m				
	cm = 0.01 m					
mm = 0.001 m						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From km to m is three steps down, so the number of meters is 1000 or 10^3 times the number of kilometers.
- Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

9 km = 9000 m

Type in 9000.

Assessment #65096 "65096 - 60271 - Conversion: x km to m"

How many meters are in 16 kilometers?

Algebra:

✓ 16000

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						km = 1000 m
					hm = 100 m	
				dam = 10 m		
			m = 1 m			
		dm = 0.1 m				
	cm = 0.01 m					
mm = 0.001 m						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth

micro- µ	10^{-6}	millionth
nano- n	10^{-9}	billionth
pico- p	10^{-12}	trillionth

From km to m is three steps down, so the number of meters is 1000 or 10^3 times the number of kilometers.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

16 km = 16000 m

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57589

How many kilometers are 7308 meters?

* Number of meters goes from 1010 to 13009.

Assistment #57589 "57589 - Conversion: x m to km"

How many kilometers are %v{x} meters?

Algebra:

✓ %v{x/1000}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m ↓

hm = 100 m ↓

dam = 10 m ↓

m = 1 m ↓

dm = 0.1 m ↓

cm = 0.01 m ↓

mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From m to km is three steps up, so the number of kilometers is 1/1000, 0.001 or 10^{-3} times the number of meters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

  When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

  %v{x} m = %v{x/1000} km

  Type in %v{x/1000}.

Assistment #60280 "60280 - Conversion: x m to km"
How many kilometers are %v{x} meters?

Algebra:

✓ %v{x/1000}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m

hm = 100 m

dam = 10 m

m = 1 m

dm = 0.1 m

cm = 0.01 m

mm = 0.001 m

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand

hecto-	h	10^2	hundred
deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From m to km is three steps up, so the number of kilometers is 1/1000, 0.001 or 10^{-3} times the number of meters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

%v{x} m = %v{x/1000} km

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65031 "65031 - 57589 - Conversion: x m to km"

How many kilometers are 9585 meters?

Algebra:

✓ 9.585

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |

hm = 100 m |

dam = 10 m |

m = 1 m |

dm = 0.1 m |

cm = 0.01 m |

mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From m to km is three steps up, so the number of kilometers is 1/1000, 0.001 or 10^{-3} times the number of meters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

9585 m = 9.585 km

Type in 9.585.

Assistment #65052 "65052 - 60280 - Conversion: x m to km"

How many kilometers are 12803 meters?

Algebra:

✓ 12.803

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						km = 1000 m
					hm = 100 m	
				dam = 10 m		
			m = 1 m			
		dm = 0.1 m				
	cm = 0.01 m					
mm = 0.001 m						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From m to km is three steps up, so the number of kilometers is 1/1000, 0.001 or 10^{-3} times the number of meters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

12803 m = 12.803 km

Multiple choice:
Ok. I have studied this example and am ready to get a new problem.

- ## 57528

How many millimeters are in 9 meters?
* Number of meters goes from 2 to 16.

Assistment #57528 "57528 - Conversion: x m to mm"
How many millimeters are in %v{x} meters?
Algebra:
%v{x*1000}
Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
hm = 100 m
↓
dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From m to mm is three steps down, so the number of millimeters is 1000 or 10^3 times the number of meters.
- Multiply the number given by 1000 or 10^3.

  When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

  %v{x} m = %v{x*1000} mm

  Type in %v{x*1000}.

Assistment #60272 "60272 - Conversion: x m to mm"
How many millimeters are in %v{x} meters?
Algebra:
✓ %v{x*1000}
Scaffold:
Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m
↓
hm = 100 m
↓
dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth

milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From m to mm is three steps down, so the number of millimeters is 1000 or 10^3 times the number of meters.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

%v{x} m = %v{x*1000} mm

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65020 "65020 - 57528 - Conversion: x m to mm"

How many millimeters are in 2 meters?

Algebra:

✓ 2000

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |
hm = 100 m |
dam = 10 m |
m = 1 m |
dm = 0.1 m |
cm = 0.01 m |
mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From m to mm is three steps down, so the number of millimeters is 1000 or 10^3 times the number of meters.
- Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

2 m = 2000 mm

Type in 2000.

Assistment #65104 "65104 - 60272 - Conversion: x m to mm"

How many millimeters are in 4 meters?

Algebra:

✓ 4000

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |

hm = 100 m
dam = 10 m
m = 1 m
dm = 0.1 m
cm = 0.01 m
mm = 0.001 m

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From m to mm is three steps down, so the number of millimeters is 1000 or 10^{3} times the number of meters.

Multiply the number given by 1000 or 10^{3}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

4 m = 4000 mm
Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

- 57590

How many meters are 8774 millimeters?
* Number of millimeters goes from 1010 to 13009.

Assistment #57590 "57590 - Conversion: x mm to m"
How many meters are %v{x} millimeters?
Algebra:
%v{x/1000}
Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |
hm = 100 m
↓
dam = 10 m
↓
m = 1 m
↓
dm = 0.1 m
↓
cm = 0.01 m
↓
mm = 0.001 m
↓

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mm to m is three steps up, so the number of meters is 1/1000, 0.001 or 10^{-3} times the number of millimeters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

  When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

  %v{x} mm = %v{x/1000} m

  Type in %v{x/1000}.

Assistment #60281 "60281 - Conversion: x mm to m"
How many meters are %v{x} millimeters?

Algebra:

✓ %v{x/1000}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m

hm = 100 m

dam = 10 m

m = 1 m

dm = 0.1 m

cm = 0.01 m

mm = 0.001 m

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From mm to m is three steps up, so the number of meters is 1/1000, 0.001 or 10^{-3} times the number of millimeters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

%v{x} mm = %v{x/1000} m

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #64947 "64947 - 57590 - Conversion: x mm to m"

How many meters are 4270 millimeters?

Algebra:

✓ 4.27

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

km = 1000 m |

hm = 100 m |

dam = 10 m |

m = 1 m |

dm = 0.1 m |

cm = 0.01 m |

mm = 0.001 m |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple

tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mm to m is three steps up, so the number of meters is 1/1000, 0.001 or 10^{-3} times the number of millimeters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

4270 mm = 4.27 m

Type in 4.27.

Assistment #65067 "65067 - 60281 - Conversion: x mm to m"

How many meters are 9435 millimeters?

Algebra:

✓ 9.435

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						km = 1000 m
					hm = 100 m	
				dam = 10 m		
			m = 1 m			
		dm = 0.1 m				
	cm = 0.01 m					
mm = 0.001 m						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From mm to m is three steps up, so the number of meters is 1/1000, 0.001 or 10^{-3} times the number of millimeters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

9435 mm = 9.435 m

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level 1.5 – Metric Volume	Number of Templates
#8823	6
Number to Master	Number of Attempts
5 in-a-row	15 First Day, 15 Subsequent Days

Templates

- 57530

How many milliliters are in 12 liters?
* Number of liters goes from 2 to 16.

Assistment #57530 "57530 - Conversion: x L to mL"
How many milliliters are in %v{x} liters?
Algebra:
✓ %v{x*1000}
Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |
hL = 100 L |
daL = 10 L |
L = 1 L |
dL = 0.1 L |
cL = 0.01 L |
mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple

tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From L to mL is three steps down, so the number of milliliters is 1000 or 10^3 times the number of liters.
- Multiply the number given by 1000 or 10^3.

  When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

  %v{x} L = %v{x*1000} mL

  Type in %v{x*1000}.

Assistment #60274 "60274 - Conversion: x L to mL"
How many milliliters are in %v{x} liters?

Algebra:

✓ %v{x*1000}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
tetra-	T	10^{12}	trillion
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From L to mL is three steps down, so the number of milliliters is 1000 or 10^3 times the number of liters.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

%v{x} L = %v{x*1000} mL

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65230 "65230 - 57530 - Conversion: x L to mL"

How many milliliters are in 2 liters?

Algebra:

✓ 2000

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one

deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From L to mL is three steps down, so the number of milliliters is 1000 or 10^3 times the number of liters.
- Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

2 L = 2000 mL

Type in 2000.

Assistment #65325 "65325 - 60274 - Conversion: x L to mL"

How many milliliters are in 5 liters?

Algebra:

✓ 5000

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						kL = 1000 L
					hL = 100 L	
				daL = 10 L		
			L = 1 L			
		dL = 0.1 L				
	cL = 0.01 L					
mL = 0.001 L						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From L to mL is three steps down, so the number of milliliters is 1000 or 10^3 times the number of liters.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

5 L = 5000 mL

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57531

How many cubic centimeters are in 12 liters?

* Number of liters goes from 2 to 16.

Assistment #57531 "57531 - Conversion: x L to cm^3"

How many cubic centimeters are in %v{x} liters?

Algebra:

✓ %v{x*1000}

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3

= 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth

pico- p 10^{-12} trillionth

- From L to mL is three steps down, so number of milliliters is 1000 or 10^3 times the number of liters.
  Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of cubic centimeters is 1000 or 10^3 times the number of liters.
- Multiply the number given by 1000 or 10^3.

  When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

  %v{x} L = %v{x*1000} cm^3

  Type in %v{x*1000}.

Assistment #60275 "60275 - Conversion: x L to cm^3"
How many cubic centimeters are in %v{x} liters?

Algebra:

✓ %v{x*1000}

Scaffold:

Here is a complete explanation:

Cubic centimeters:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.

Metric system:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

Solving the problem:

From L to mL is three steps down, so number of milliliters is 1000 or 10^3 times the number of liters.

Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of cubic centimeters is 1000 or 10^3 times the number of liters.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

%v{x} L = %v{x*1000} cm^3

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65245 "65245 - 57531 - Conversion: x L to cm^3"

How many cubic centimeters are in 15 liters?

Algebra:

15000

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

  The important aspect here, however, is that 1 cm^3 = 1 mL.
- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |
hL = 100 L |
daL = 10 L |
L = 1 L |
dL = 0.1 L |
cL = 0.01 L |
mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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giga-	G	10^{9}	billion

mega-	M	10^6	million
kilo-	k	10^3	thousand
hecto-	h	10^2	hundred
deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From L to mL is three steps down, so number of milliliters is 1000 or 10^3 times the number of liters. Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of cubic centimeters is 1000 or 10^3 times the number of liters.
- Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

15 L = 15000 cm^3

Type in 15000.

Assistment #65343 "65343 - 60275 - Conversion: x L to cm^3"

How many cubic centimeters are in 8 liters?

Algebra:

✓ 8000

Scaffold:

Here is a complete explanation:

Cubic centimeters:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.

Metric system:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |
daL = 10 L |
L = 1 L |
dL = 0.1 L |
cL = 0.01 L |
mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
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hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

Solving the problem:

From L to mL is three steps down, so number of milliliters is 1000 or 10^3 times the number of liters. Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of cubic centimeters is 1000 or 10^3 times the number of liters.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

8 L = 8000 cm^3

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

- # 57592

How many liters are 9231 milliliters?

* Number of milliliters goes from 1010 to 13009.

Assistment #57592 "57592 - Conversion: x mL to L"

How many liters are %v{x} milliliters?

Algebra:

%v{x/1000}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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kilo-	k	10^3	thousand
hecto-	h	10^2	hundred
deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mL to L is three steps up, so the number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

  When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

  %v{x} mL = %v{x/1000} L

  Type in %v{x/1000}.

Assistment #60283 "60283 - Conversion: x mL to L"
How many liters are %v{x} milliliters?
Algebra:
✓ %v{x/1000}
Scaffold:
Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |
hL = 100 L |
daL = 10 L |
L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

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hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From mL to L is three steps up, so the number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

%v{x} mL = %v{x/1000} L

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65265 "65265 - 57592 - Conversion: x mL to L"

How many liters are 12548 milliliters?

Algebra:

✓ 12.548

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth

micro- µ	10^{-6}	millionth
nano- n	10^{-9}	billionth
pico- p	10^{-12}	trillionth

- From mL to L is three steps up, so the number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

12548 mL = 12.548 L

Type in 12.548.

Assistment #65394 "65394 - 60283 - Conversion: x mL to L"

How many liters are 4063 milliliters?

Algebra:

✓ 4.063

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						kL = 1000 L |
					hL = 100 L |	
				daL = 10 L |		
			L = 1 L |			
		dL = 0.1 L |				
	cL = 0.01 L |					
mL = 0.001 L |						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

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kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From mL to L is three steps up, so the number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

4063 mL = 4.063 L

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57593

How many liters are 11655 cubic centimeters?

* Number of cubic centimeters goes from 1010 to 13009.

Assistment #57593 "57593 - Conversion: x cm^3 to L"

How many liters are %v{x} cubic centimeters?

Algebra:

✓ %v{x/1000}

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

hL = 100 L |

daL = 10 L |

L = 1 L |

dL = 0.1 L |

cL = 0.01 L |

mL = 0.001 L |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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hecto-	h	10^{2}	hundred
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deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mL to L is three steps up, so number of liters is 1/1000, 0.001 or 10^{-3} times the number

of milliliters.
Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of liters is 1/1000, 0.001 or 10^{-3} times the number of cubic centimeters.

- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

  When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

  %v{x} cm^3 = %v{x/1000} L

  Type in %v{x/1000}.

Assistment #60284 "60284 - Conversion: x cm^3 to L"
How many liters are %v{x} cubic centimeters?
Algebra:
✓ %v{x/1000}
Scaffold:

Here is a complete explanation:

Cubic centimeters:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.

Metric system:
The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L

hL = 100 L

daL = 10 L

L = 1 L

dL = 0.1 L

cL = 0.01 L

mL = 0.001 L

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

Solving the problem:

From mL to L is three steps up, so number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters.

Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of liters is 1/1000, 0.001 or 10^{-3} times the number of cubic centimeters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

%v{x} cm^3 = %v{x/1000} L

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

Assistment #65293 "65293 - 57593 - Conversion: x cm^3 to L"

How many liters are 6717 cubic centimeters?

Algebra:

6.717

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

  The important aspect here, however, is that 1 cm^3 = 1 mL.
- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

  kL = 1000 L |
  hL = 100 L |
  daL = 10 L |
  L = 1 L |
  dL = 0.1 L |
  cL = 0.01 L |
  mL = 0.001 L |

  The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

  In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

  The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
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mega-	M	10^{6}	million

kilo-	k	10^3	thousand
hecto-	h	10^2	hundred
deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From mL to L is three steps up, so number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters. Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of liters is 1/1000, 0.001 or 10^{-3} times the number of cubic centimeters.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

6717 cm^3 = 6.717 L

Type in 6.717.

Assistment #65408 "65408 - 60284 - Conversion: x cm^3 to L"

How many liters are 3597 cubic centimeters?

Algebra:

✓ 3.597

Scaffold:

Here is a complete explanation:

Cubic centimeters:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.

Metric system:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kL = 1000 L |

					hL = 100 L
				daL = 10 L	
			L = 1 L		
		dL = 0.1 L			
	cL = 0.01 L				
mL = 0.001 L					

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

Solving the problem:
From mL to L is three steps up, so number of liters is 1/1000, 0.001 or 10^{-3} times the number of milliliters. Since 1 mL = 1 cm^3, the unit mL can be replaced by the unit cm^3 and the number of liters is 1/1000, 0.001 or 10^{-3} times the number of cubic centimeters.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

3597 cm^3 = 3.597 L
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

- # 57532

How many cubic centimeters are in 132 milliliters?
* Number of milliliters goes from 2 to 151.

Assistment #57532 "57532 - Conversion: x mL to cm^3"
How many cubic centimeters are in %v{x} milliliters?
Algebra:
✓ %v{x}
Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

  The important aspect here, however, is that 1 cm^3 = 1 mL.
  The two units are identical.
- Since the units are identical, type in the same number as given.

  %v{x} mL = %v{x} cm^3

  Type in %v{x}.

Assistment #60276 "60276 - Conversion: x mL to cm^3"
How many cubic centimeters are in %v{x} milliliters?
Algebra:
✓ %v{x}
Scaffold:
Here is a complete explanation:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.
The two units are identical.

Since the units are identical, type in the same number as given.

%v{x} mL = %v{x} cm^3

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65277 "65277 - 57532 - Conversion: x mL to cm^3"

How many cubic centimeters are in 115 milliliters?

Algebra:

✓ 115

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

  The important aspect here, however, is that 1 cm^3 = 1 mL.
  The two units are identical.
- Since the units are identical, type in the same number as given.

  115 mL = 115 cm^3

  Type in 115.

Assistment #65359 "65359 - 60276 - Conversion: x mL to cm^3"

How many cubic centimeters are in 145 milliliters?

Algebra:

✓ 145

Scaffold:

Here is a complete explanation:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.
The two units are identical.

Since the units are identical, type in the same number as given.

145 mL = 145 cm^3

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57533

How many milliliters are in 23 cubic centimeters?
* Number of cubic centimeters goes from 2 to 151.

Assistment #57533 "57533 - Conversion: x cm^3 to mL"
How many milliliters are in %v{x} cubic centimeters?

Algebra:

✓ %v{x}

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

  The important aspect here, however, is that 1 cm^3 = 1 mL.
  The two units are identical .
- Since the units are identical, type in the same number as given.

  %v{x} cm^3 = %v{x} mL

  Type in %v{x}.

Assistment #60277 "60277 - Conversion: x cm^3 to mL"
How many milliliters are in %v{x} cubic centimeters?

Algebra:

✓ %v{x}

Scaffold:

Here is a complete explanation:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.
The two units are identical .

Since the units are identical, type in the same number as given.

%v{x} cm^3 = %v{x} mL

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65315 "65315 - 57533 - Conversion: x cm^3 to mL"

How many milliliters are in 20 cubic centimeters?

Algebra:

✓ 20

Hints:

- It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

  The important aspect here, however, is that 1 cm^3 = 1 mL.
  The two units are identical .
- Since the units are identical, type in the same number as given.

  20 cm^3 = 20 mL

  Type in 20.

Assistment #65379 "65379 - 60277 - Conversion: x cm^3 to mL"

How many milliliters are in 30 cubic centimeters?

Algebra:

✓ 30

Scaffold:

Here is a complete explanation:

It is worth noting that cm^3 is in fact a unit of volume like L and mL are. This is because a volume is three lengths multiplied together multiplied by some number with no units. 1 cm^3 = 1 cm * 1 cm * 1 cm, called a centimeter cubed or a cubic centimeter, is equal to the volume of a cube with sides of length 1 cm. Another abreviation used for this unit is cc.

The important aspect here, however, is that 1 cm^3 = 1 mL.
The two units are identical .

Since the units are identical, type in the same number as given.

30 cm^3 = 30 mL

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level – 1.6 Metric Mass #8824	Number of Templates 2
Number to Master 5 in-a-row	Number of Attempts 15 First Day, 15 Subsequent Days

Templates

- 57529

How many grams are in 15 kilograms?
* Number of kilograms goes from 2 to 16.

Assistment #57529 "57529 - Conversion: x kg to g"
How many grams are in %v{x} kilograms?

Algebra:

✓ %v{x*1000}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |

hg = 100 g |

dag = 10 g |

g = 1 g |

dg = 0.1 g |

cg = 0.01 g |

mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From kg to g is three steps down, so the number of grams is 1000 or 10^3 times the number fo kilograms.
- Multiply the number given by 1000 or 10^3.

  When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

  %v{x} kg = %v{x*1000} g

Type in %v{x*1000}.

Assistment #60273 "60273 - Conversion: x kg to g"
How many grams are in %v{x} kilograms?

Algebra:

✓ %v{x*1000}

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |
hg = 100 g |
dag = 10 g |
g = 1 g |
dg = 0.1 g |
cg = 0.01 g |
mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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giga-	G	10^{9}	billion
mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten

--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From kg to g is three steps down, so the number of grams is 1000 or 10^{3} times the number fo kilograms.

Multiply the number given by 1000 or 10^{3}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

%v{x} kg = %v{x*1000} g

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assessment #65159 "65159 - 57529 - Conversion: x kg to g"

How many grams are in 9 kilograms?

Algebra:

✓ 9000

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |

hg = 100 g |

dag = 10 g |

g = 1 g |

dg = 0.1 g |

cg = 0.01 g |

mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From kg to g is three steps down, so the number of grams is 1000 or 10^{3} times the number fo kilograms.
- Multiply the number given by 1000 or 10^{3}.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

9 kg = 9000 g

Type in 9000.

Assistment #65212 "65212 - 60273 - Conversion: x kg to g"

How many grams are in 13 kilograms?

Algebra:

✓ 13000

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |
hg = 100 g |
dag = 10 g |
g = 1 g |
dg = 0.1 g |
cg = 0.01 g |
mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	**Abbreviation**	**Multiple**	**English for Multiple**
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From kg to g is three steps down, so the number of grams is 1000 or 10^3 times the number fo kilograms.

Multiply the number given by 1000 or 10^3.

When multiplying by powers of ten, move the decimal point to the right (→) a number of places equal to the power of ten. Since here you need 3 powers of ten, move the decimal point over 3 places to the right.

13 kg = 13000 g

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57591

How many kilograms are 2135 grams?

* Number of grams goes from 1010 to 13009.

Assistment #57591 "57591 - Conversion: x g to kg"

How many kilograms are %v{x} grams?

Algebra:

✓ %v{x/1000}

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |

hg = 100 g |

dag = 10 g |

g = 1 g |

dg = 0.1 g |

cg = 0.01 g |

mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
tetra-	T	10^{12}	trillion
giga-	G	10^{9}	billion

mega-	M	10^6	million
kilo-	k	10^3	thousand
hecto-	h	10^2	hundred
deka-	da	10^1	ten
--------	--------	10^0	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From g to kg is three steps up, so the number of kilograms is 1/1000, 0.001 or 10^{-3} times the number fo grams.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^3$.

  When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

  %v{x} g = %v{x/1000} kg

  Type in %v{x/1000}.

Assistment #60282 "60282 - Conversion: x g to kg"
How many kilograms are %v{x} grams?
Algebra:
✓ %v{x/1000}
Scaffold:
Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |
hg = 100 g |
dag = 10 g |
g = 1 g |

dg = 0.1 g |

cg = 0.01 g |

mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From g to kg is three steps up, so the number of kilograms is 1/1000, 0.001 or 10^{-3} times the number fo grams.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (←) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

%v{x} g = %v{x/1000} kg

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assessment #65139 "65139 - 57591 - Conversion: x g to kg"

How many kilograms are 2669 grams?

Algebra:

✓ 2.669

Hints:

- The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

kg = 1000 g |

hg = 100 g |

dag = 10 g |

g = 1 g |

dg = 0.1 g |

cg = 0.01 g |

mg = 0.001 g |

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

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mega-	M	10^{6}	million
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hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
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deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth

milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

- From g to kg is three steps up, so the number of kilograms is 1/1000, 0.001 or 10^{-3} times the number fo grams.
- Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

2669 g = 2.669 kg

Type in 2.669.

Assessment #65190 "65190 - 60282 - Conversion: x g to kg"

How many kilograms are 3835 grams?

Algebra:

3.835

Scaffold:

Here is a complete explanation:

The metric system is based on powers of ten. This can be visualized with the following stair-step pattern:

						kg = 1000 g
					hg = 100 g	
				dag = 10 g		
			g = 1 g			
		dg = 0.1 g				
	cg = 0.01 g					
mg = 0.001 g						

The number of steps you go down equals the power of 10 you multiply the original number by. The number of steps you go up equals the power of 10 you divide by.

In general the prefixes determine the power of 10 the base unit is multiplied by to get the size of the new unit. The prefixes are listed on the table below.

The power indicates the number of times to multiply by 10 where negative powers indicate division instead of multiplication.

Prefix	Abbreviation	Multiple	English for Multiple
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mega-	M	10^{6}	million
kilo-	k	10^{3}	thousand
hecto-	h	10^{2}	hundred
deka-	da	10^{1}	ten
--------	--------	10^{0}	one
deci-	d	10^{-1}	tenth
centi-	c	10^{-2}	hundredth
milli-	m	10^{-3}	thousandth
micro-	µ	10^{-6}	millionth
nano-	n	10^{-9}	billionth
pico-	p	10^{-12}	trillionth

From g to kg is three steps up, so the number of kilograms is 1/1000, 0.001 or 10^{-3} times the number fo grams.

Divide the number given by 1000 or multiply it by $10^{-3} = 1/10^{3}$.

When dividing by powers of ten, move the decimal point to the left (⟵) a number of places equal to the power of ten. Since here you need -3 powers of ten, move the decimal point over 3 places to the left.

3835 g = 3.835 kg

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level 1.7 / 2.3 – Time	Number of Templates
#8825	8
Number to Master	Number of Attempts
5 in-a-row	15 First Day, 15 Subsequent Days

Templates

- 57594

How many seconds are in 8 minutes?

* Number of minutes goes from 2 to 16.

Assistment #57594 "57594 - Conversion: x min to s"
How many seconds are in %v{x} minutes?

Algebra:

✓ %v{x*60}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 min = 60 s.

  You are going from minutes to seconds, so the number of seconds will be larger than %v{x} by a factor of 60.
- Multiply the number given by the conversion formula.

%v{x} min = %v{x} min * 60 $\frac{\textbf{s}}{\textbf{min}}$ = %v{x*60} s

Type in %v{x*60}.

Assistment #60285 "60285 - Conversion: x min to s"
How many seconds are in %v{x} minutes?

Algebra:

✓ %v{x*60}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 min = 60 s.

You are going from minutes to seconds, so the number of seconds will be larger than %v{x} by a factor of 60.

Multiply the number given by the conversion formula.

%v{x} min = %v{x} min * 60 $\frac{\text{s}}{\text{min}}$ = %v{x*60} s

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65469 "65469 - 57594 - Conversion: x min to s"

How many seconds are in 7 minutes?

Algebra:

✓ 420

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 min = 60 s.

You are going from minutes to seconds, so the number of seconds will be larger than 7 by a factor of 60.

- Multiply the number given by the conversion formula.

$$7\text{ min} = 7\text{ min} * 60\,\frac{\textbf{s}}{\textbf{min}} = 420\text{ s}$$

Type in 420.

Assistment #65521 "65521 - 60285 - Conversion: x min to s"

How many seconds are in 13 minutes?

Algebra:

✓ 780

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	

30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 min = 60 s.

You are going from minutes to seconds, so the number of seconds will be larger than 13 by a factor of 60.

Multiply the number given by the conversion formula.

$13 \text{ min} = 13 \text{ min} * 60 \frac{\textbf{s}}{\textbf{min}} = 780 \text{ s}$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57595

How many minutes are in 5 hours?
* Number of hours goes from 2 to 16.

Assistment #57595 "57595 - Conversion: x hr to min"
How many minutes are in %v{x} hours?
Algebra:
✓ %v{x*60}
Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the

	moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 hr = 60 min.

  You are going from hours to minutes, so the number of minutes will be larger than %v{x} by a factor of 60.
- Multiply the number given by the conversion formula.

$$\%v\{x\}\ hr = \%v\{x\}\ hr * 60 \frac{\textbf{min}}{\textbf{hr}} = \%v\{x*60\}\ min$$

Type in %v{x*60}.

Assistment #60286 "60286 - Conversion: x hr to min"
How many minutes are in %v{x} hours?

Algebra:

%v{x*60}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 hr = 60 min.

You are going from hours to minutes, so the number of minutes will be larger than %v{x} by a factor of 60.

Multiply the number given by the conversion formula.

%v{x} hr = %v{x} hr * 60 $\frac{\textbf{min}}{\textbf{hr}}$ = %v{x*60} min

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65507 "65507 - 57595 - Conversion: x hr to min"

How many minutes are in 8 hours?

Algebra:

✓ 480

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 hr = 60 min.

You are going from hours to minutes, so the number of minutes will be larger than 8 by a factor of 60.

- Multiply the number given by the conversion formula.

8 hr = 8 hr * 60 $\frac{\textbf{min}}{\textbf{hr}}$ = 480 min

Type in 480.

Assistment #65543 "65543 - 60286 - Conversion: x hr to min"

How many minutes are in 15 hours?

Algebra:

✓ 900

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 hr = 60 min.

You are going from hours to minutes, so the number of minutes will be larger than 15 by a factor of 60.

Multiply the number given by the conversion formula.

$$15 \text{ hr} = 15 \text{ hr} * 60 \frac{\textbf{min}}{\textbf{hr}} = 900 \text{ min}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57604

How many minutes are 540 seconds?

* Number of minutes goes from 2 to 16.

Assistment #57604 "57604 - Conversion: x s to min"
How many minutes are %v{x} seconds?

Algebra:

✓ %v{x/60}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 min = 60 s.

  You are going from seconds to minutes, so the number of minutes will be smaller than %v{x} by a factor of 60.
- Multiply the number given by the conversion formula.

%v{x} s = %v{x} s * $\frac{\textbf{1 min}}{\textbf{60 s}}$ = %v{x/60} min

Type in %v{x/60}.

Assistment #60290 "60290 - Conversion: x s to min"
How many minutes are %v{x} seconds?

Algebra:

✓ %v{x/60}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 min = 60 s.

You are going from seconds to minutes, so the number of minutes will be smaller than %v{x} by a factor of 60.

Multiply the number given by the conversion formula.

%v{x} s = %v{x} s * $\frac{\textbf{1 min}}{\textbf{60 s}}$ = %v{x/60} min

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65458 "65458 - 57604 - Conversion: x s to min"

How many minutes are 480 seconds?

Algebra:

✓ 8

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 min = 60 s.

You are going from seconds to minutes, so the number of minutes will be smaller than 480 by a factor of 60.

- Multiply the number given by the conversion formula.

$$480 \text{ s} = 480 \text{ s} * \frac{\textbf{1 min}}{\textbf{60 s}} = 8 \text{ min}$$

Type in 8.

Assistment #65601 "65601 - 60290 - Conversion: x s to min"

How many minutes are 540 seconds?

Algebra:

✓ 9

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution

	time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 min = 60 s.

You are going from seconds to minutes, so the number of minutes will be smaller than 540 by a factor of 60.

Multiply the number given by the conversion formula.

$$540\text{ s} = 540\text{ s} * \frac{\mathbf{1\ min}}{\mathbf{60\ s}} = 9\text{ min}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57605

How many hours are 120 minutes?
* Number of hours goes from 2 to 16.

Assistment #57605 "57605 - Conversion: x min to hr"
How many hours are %v{x} minutes?

Algebra:

✓ %v{x/60}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the

	moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 hr = 60 min.

  You are going from minutes to hours, so the number of hours will be smaller than %v{x} by a factor of 60.
- Multiply the number given by the conversion formula.

%v{x} min = %v{x} min * **1 hr** / **60 min** = %v{x/60} hr

Type in %v{x/60}.

Assistment #60291 "60291 - Conversion: x min to hr"
How many hours are %v{x} minutes?

Algebra:

✓ %v{x/60}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 hr = 60 min.

You are going from minutes to hours, so the number of hours will be smaller than %v{x} by a factor of 60.

Multiply the number given by the conversion formula.

%v{x} min = %v{x} min * $\frac{\textbf{1 hr}}{\textbf{60 min}}$ = %v{x/60} hr

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65482 "65482 - 57605 - Conversion: x min to hr"

How many hours are 240 minutes?

Algebra:

✓ 4

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 hr = 60 min.

You are going from minutes to hours, so the number of hours will be smaller than 240 by a factor of 60.

- Multiply the number given by the conversion formula.

240 min = 240 min * $\frac{\textbf{1 hr}}{\textbf{60 min}}$ = 4 hr

Type in 4.

Assessment #65533 "65533 - 60291 - Conversion: x min to hr"

How many hours are 540 minutes?

Algebra:

✓ 9

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 hr = 60 min.

You are going from minutes to hours, so the number of hours will be smaller than 540 by a factor of 60.

Multiply the number given by the conversion formula.

$$540 \text{ min} = 540 \text{ min} * \frac{\mathbf{1\ hr}}{\mathbf{60\ min}} = 9 \text{ hr}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57596

How many hours are in 19 days?

* Number of days goes from 2 to 26.

Assistment #57596 "57596 - Conversion: x day to hr"
How many hours are in %v{x} days?

Algebra:

✓ %v{x*24}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 day = 24 hours.

  You are going from days to hours, so the number of hours will be larger than %v{x} by a factor of 24.
- Multiply the number given by the conversion formula.

%v{x} days = %v{x} days * 24 $\frac{\textbf{hr}}{\textbf{day}}$ = %v{x*24} hr

Type in %v{x*24}.

Assistment #60287 "60287 - Conversion: x day to hr"
How many hours are in %v{x} days?

Algebra:

✓ %v{x*24}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 day = 24 hours.

You are going from days to hours, so the number of hours will be larger than %v{x} by a factor of 24.

Multiply the number given by the conversion formula.

%v{x} days = %v{x} days * 24 $\frac{\textbf{hr}}{\textbf{day}}$ = %v{x*24} hr

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assessment #65421 "65421 - 57596 - Conversion: x day to hr"

How many hours are in 19 days?

Algebra:

✓ 456

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 day = 24 hours.

You are going from days to hours, so the number of hours will be larger than 19 by a factor of 24.

- Multiply the number given by the conversion formula.

$$19 \text{ days} = 19 \text{ days} * 24 \frac{\textbf{hr}}{\textbf{day}} = 456 \text{ hr}$$

Type in 456.

Assistment #65565 "65565 - 60287 - Conversion: x day to hr"

How many hours are in 13 days?

Algebra:

✓ 312

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution

	time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 day = 24 hours.

You are going from days to hours, so the number of hours will be larger than 13 by a factor of 24.

Multiply the number given by the conversion formula.

13 days = 13 days * 24 $\frac{\textbf{hr}}{\textbf{day}}$ = 312 hr

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57606

How many days are 360 hours?
* Number of days goes from 2 to 26.

Assistment #57606 "57606 - Conversion: x hr to day"
How many days are %v{x} hours?
Algebra:

✓ %v{x/24}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.

365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 day = 24 hours.

  You are going from hours to days, so the number of days will be smaller than %v{x} by a factor of 24.
- Multiply the number given by the conversion formula.

%v{x} hr = %v{x} hr * **1 day** / **24 hr** = %v{x/24} days

Type in %v{x/24}.

Assistment #60292 "60292 - Conversion: x hr to day"
How many days are %v{x} hours?

Algebra:

✓ %v{x/24}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 day = 24 hours.

You are going from hours to days, so the number of days will be smaller than %v{x} by a factor of 24.

Multiply the number given by the conversion formula.

$$\%v\{x\}\ \text{hr} = \%v\{x\}\ \text{hr} * \frac{\mathbf{1\ day}}{\mathbf{24\ hr}} = \%v\{x/24\}\ \text{days}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65493 "65493 - 57606 - Conversion: x hr to day"

How many days are 720 hours?

Algebra:

✓ 30

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 day = 24 hours.

You are going from hours to days, so the number of days will be smaller than 720 by a factor of 24.

- Multiply the number given by the conversion formula.

$$720\ \text{hr} = 720\ \text{hr} * \frac{\mathbf{1\ day}}{\mathbf{24\ hr}} = 30\ \text{days}$$

Type in 30.

Assistment #65553 "65553 - 60292 - Conversion: x hr to day"

How many days are 960 hours?

Algebra:

✓ 40

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 day = 24 hours.

You are going from hours to days, so the number of days will be smaller than 960 by a factor of 24.

Multiply the number given by the conversion formula.

$$960 \text{ hr} = 960 \text{ hr} * \frac{\textbf{1 day}}{\textbf{24 hr}} = 40 \text{ days}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57597

How many days are in 9 years?

* Number of years goes from 2 to 16.

Assistment #57597 "57597 - Conversion: x year to day"
How many days are in %v{x} years?

Algebra:

✓ %v{x*365}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 year = 365 days.

  You are going from years to days, so the number of days will be larger than %v{x} by a factor of 365.
- Multiply the number given by the conversion formula.

$$\%v\{x\}\ \text{years} = \%v\{x\}\ \text{years} * 365 \frac{\textbf{days}}{\textbf{year}} = \%v\{x*365\}\ \text{days}$$

Type in %v{x*365}.

Assistment #60288 "60288 - Conversion: x year to day"
How many days are in %v{x} years?

Algebra:

✓ %v{x*365}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 year = 365 days.

You are going from years to days, so the number of days will be larger than %v{x} by a factor of 365.

Multiply the number given by the conversion formula.

%v{x} years = %v{x} years * 365 $\frac{\textbf{days}}{\textbf{year}}$ = %v{x*365} days

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65447 "65447 - 57597 - Conversion: x year to day"

How many days are in 8 years?

Algebra:

✓ 2920

Hints:

- Typical conversion factors for measurement of time is given in the table below.

<u>Time</u>	<u>Notes</u>
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 1 year = 365 days.

You are going from years to days, so the number of days will be larger than 8 by a factor of 365.

- Multiply the number given by the conversion formula.

$$8 \text{ years} = 8 \text{ years} * 365 \frac{\textbf{days}}{\textbf{year}} = 2920 \text{ days}$$

Type in 2920.

Assistment #65589 "65589 - 60288 - Conversion: x year to day"

How many days are in 15 years?

Algebra:

✓ 5475

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

<u>Time</u>	<u>Notes</u>
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution

	time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 1 year = 365 days.

You are going from years to days, so the number of days will be larger than 15 by a factor of 365.

Multiply the number given by the conversion formula.

15 years = 15 years * 365 $\frac{\textbf{days}}{\textbf{year}}$ = 5475 days

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- # 57607

How many years are 4015 days?
* Number of years goes from 2 to 16.

Assistment #57607 "57607 - Conversion: x day to year"
How many years are %v{x} days?

Algebra:

✓ %v{x/365}

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.

365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 365 days = 1 year.

  You are going from days to years, so the number of years will be smaller than %v{x} by a factor of 365.
- Multiply the number given by the conversion formula.

%v{x} days = %v{x} days * **1 year** / **365 days** = %v{x/365} years

Type in %v{x/365}.

Assistment #60293 "60293 - Conversion: x day to year"
How many years are %v{x} days?

Algebra:

✓ %v{x/365}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 365 days = 1 year.

You are going from days to years, so the number of years will be smaller than %v{x} by a factor of 365.

Multiply the number given by the conversion formula.

%v{x} days = %v{x} days * $\frac{\textbf{1 year}}{\textbf{365 days}}$ = %v{x/365} years

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65434 "65434 - 57607 - Conversion: x day to year"

How many years are 4380 days?

Algebra:

✓ 12

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- The converson rate of interest is: 365 days = 1 year.

You are going from days to years, so the number of years will be smaller than 4380 by a factor of 365.

- Multiply the number given by the conversion formula.

4380 days = 4380 days * $\frac{\textbf{1 year}}{\textbf{365 days}}$ = 12 years

Type in 12.

Assistment #65581 "65581 - 60293 - Conversion: x day to year"

How many years are 5840 days?

Algebra:

✓ 16

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

The converson rate of interest is: 365 days = 1 year.

You are going from days to years, so the number of years will be smaller than 5840 by a factor of 365.

Multiply the number given by the conversion formula.

$$5840 \text{ days} = 5840 \text{ days} * \frac{\textbf{1 year}}{\textbf{365 days}} = 16 \text{ years}$$

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Problem Set Level Level 3 – Single Conversions	Number of Templates
#8829	40

Number to Master	Number of Attempts
5 in-a-row	15 First Day, 15 Subsequent Days

Templates
All from 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7.

Problem Set Level 4 – Double Conversions	Number of Templates
#8826	6
Number to Master	**Number of Attempts**
5 in-a-row	15 First Day, 15 Subsequent Days

Templates

- 57598

How many yards are in 3 miles?
You may use the conversion formula 1 ft = 5280 mi.
* Number of miles goes from 2 to 21.

Assistment #57598 "57598 - Conversion: x Mi to Yd"
How many yards are in %v{x} miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ %v{x*1760}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

  The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.
- Here will be presented two methods to conceptualize this problem.

  First method:
  Since 3 ft = 1 yd, the inverse, 1 ft = 1/3 yd, is also true.

  Replacing this in the formula

  %v{x} mi = %v{x} * 1 mi = %v{x} * 5280 ft = %v{x*5280} ft = %v{x*5280} * 1 ft,

  you get

  %v{x} * 1 mi = %v{x*5280} * 1/3 yd = %v{x*5280}/3 yd = %v{x*5280/3} yd.

  Second method:
  In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{1 yd}}{\textbf{3 ft}} = \frac{\textbf{5280 ft}}{\textbf{1 mi}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{mi} = \frac{\textbf{\%v\{x\} mi * 1 yd * 5280 ft}}{\textbf{3 ft * 1 mi}}$$

Now multiply the given number (%v{x} mi) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.

$$\%v\{x\}\ \textbf{mi} = \frac{\textbf{\%v\{x\} * 5280 yd}}{\textbf{3}} = \%v\{x*1760\}\ \textbf{yd}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} mi = %v{x*1760} yd.
Type in %v{x*1760}.

Assistment #62170 "62170 - Conversion: x Mi to Yd"

How many yards are in %v{x} miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ %v{x*1760}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

Here will be presented two methods to conceptualize this problem.

First method:

Since 3 ft = 1 yd, the inverse, 1 ft = 1/3 yd, is also true.

Replacing this in the formula

%v{x} mi = %v{x} * 1 mi = %v{x} * 5280 ft = %v{x*5280} ft = %v{x*5280} * 1 ft,

you get

%v{x} * 1 mi = %v{x*5280} * 1/3 yd = %v{x*5280}/3 yd = %v{x*5280/3} yd.

Second method:

In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{1 yd}}{\textbf{3 ft}} = \frac{\textbf{5280 ft}}{\textbf{1 mi}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the

equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \mathbf{mi} = \frac{\%v\{x\}\ \mathbf{mi} * 1\ \mathbf{yd} * 5280\ \mathbf{ft}}{3\ \mathbf{ft} * 1\ \mathbf{mi}}$$

Now multiply the given number (%v{x} mi) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.

$$\%v\{x\}\ \mathbf{mi} = \frac{\%v\{x\} * 5280\ \mathbf{yd}}{3} = \%v\{x*1760\}\ \mathbf{yd}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} mi = %v{x*1760} yd.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65632 "65632 - 57598 - Conversion: x Mi to Yd"

How many yards are in 18 miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ 31680

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

- Here will be presented two methods to conceptualize this problem.

First method:
Since 3 ft = 1 yd, the inverse, 1 ft = 1/3 yd, is also true.

Replacing this in the formula

18 mi = 18 * 1 mi = 18 * 5280 ft = 95040 ft = 95040 * 1 ft,

you get

18 * 1 mi = 95040 * 1/3 yd = 95040/3 yd = 31680 yd.

Second method:
In this method, the units are treated similar to numbers.

$1 = \frac{\mathbf{1\ yd}}{\mathbf{3\ ft}} = \frac{\mathbf{5280\ ft}}{\mathbf{1\ mi}}$	Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$18\ \mathbf{mi} = \frac{\mathbf{18\ mi * 1\ yd * 5280\ ft}}{\mathbf{3\ ft * 1\ mi}}$	Now multiply the given number (18 mi) by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.
$18\ \mathbf{mi} = \frac{\mathbf{18 * 5280\ yd}}{\mathbf{3}} = 31680\ \mathbf{yd}$	Divide both top and bottom by the unit ft and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 18 mi = 31680 yd.
Type in 31680.

Assistment #65758 "65758 - 62170 - Conversion: x Mi to Yd"

How many yards are in 20 miles?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ 35200

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint

		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

Here will be presented two methods to conceptualize this problem.

First method:
Since 3 ft = 1 yd, the inverse, 1 ft = 1/3 yd, is also true.

Replacing this in the formula

20 mi = 20 * 1 mi = 20 * 5280 ft = 105600 ft = 105600 * 1 ft,

you get

20 * 1 mi = 105600 * 1/3 yd = 105600/3 yd = 35200 yd.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{1\ yd}}{\mathbf{3\ ft}} = \frac{\mathbf{5280\ ft}}{\mathbf{1\ mi}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$20\ \mathbf{mi} = \frac{\mathbf{20\ mi * 1\ yd * 5280\ ft}}{\mathbf{3\ ft * 1\ mi}}$$

Now multiply the given number (20 mi) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.

$$20\ \mathbf{mi} = \frac{\mathbf{20 * 5280\ yd}}{\mathbf{3}} = 35200\ \mathbf{yd}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 20 mi = 35200 yd.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57599

How many inches are in 7 yards?
* Number of yards goes from 2 to 36.

Assistment #57599 "57599 - Conversion: x Yd to In"
How many inches are in %v{x} yards?
Algebra:
✓ %v{x*36}
Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

  The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.
- Here will be presented two methods to conceptualize this problem.

  First method:
  Placing one formula in the other, you get:
  %v{x} yds = %v{x} * 1 yd = %v{x} * 3 ft = %v{x*3} ft = %v{x*3} * 1 ft = %v{x*3} * 12 in = %v{x*36} in.

  Second method:
  In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{3 ft}}{\textbf{1 yd}} = \frac{\textbf{12 in}}{\textbf{1 ft}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

%v{x} **%v{x} yd * 3**

Now multiply the given number (%v{x} yd) by the two conversion formulae.

yd = $\frac{\textbf{ft * 12 in}}{\textbf{1 yd * 1 ft}}$	Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.
%v{x} **yd** = %v{x} * 3 * 12 **in** = %v{x*36} **in**	Divide both top and bottom by the unit **yd** * **ft** and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} yd = %v{x*36} in.
Type in %v{x*36}.

Assistment #60289 "60289 - Conversion: x Yd to In"
How many inches are in %v{x} yards?

Algebra:

✓ %v{x*36}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
%v{x} yds = %v{x} * 1 yd = %v{x} * 3 ft = %v{x*3} ft = %v{x*3} * 1 ft = %v{x*3} * 12 in =

%v{x*36} in.

Second method:
In this method, the units are treated similar to numbers.

1 = **3 ft** / **1 yd** = **12 in** / **1 ft**	Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} **yd** = **%v{x} yd * 3 ft * 12 in** / **1 yd * 1 ft**	Now multiply the given number (%v{x} yd) by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.
%v{x} **yd** = %v{x} * 3 * 12 **in** = %v{x*36} **in**	Divide both top and bottom by the unit **yd** * **ft** and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} yd = %v{x*36} in.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65677 "65677 - 57599 - Conversion: x Yd to In"

How many inches are in 2 yards?

Algebra:

✓ 72

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint

2 pint = 1 quart
4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

- Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
2 yds = 2 * 1 yd = 2 * 3 ft = 6 ft = 6 * 1 ft = 6 * 12 in = 72 in.

Second method:
In this method, the units are treated similar to numbers.

$1 = \frac{\mathbf{3\ ft}}{\mathbf{1\ yd}} = \frac{\mathbf{12\ in}}{\mathbf{1\ ft}}$	Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$2\ yd = \frac{\mathbf{2\ yd * 3\ ft * 12\ in}}{\mathbf{1\ yd * 1\ ft}}$	Now multiply the given number (2 yd) by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.
2 **yd** = 2 * 3 * 12 **in** = 72 **in**	Divide both top and bottom by the unit **yd** * **ft** and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 2 yd = 72 in.
Type in 72.

Assistment #65743 "65743 - 60289 - Conversion: x Yd to In"
How many inches are in 23 yards?
Algebra:
✓ 828
Scaffold:
Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume

12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
23 yds = 23 * 1 yd = 23 * 3 ft = 69 ft = 69 * 1 ft = 69 * 12 in = 828 in.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{3 ft}}{\textbf{1 yd}} = \frac{\textbf{12 in}}{\textbf{1 ft}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$23\ \textbf{yd} = \frac{\textbf{23 yd * 3 ft * 12 in}}{\textbf{1 yd * 1 ft}}$$

Now multiply the given number (23 yd) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.

23 **yd** = 23 * 3 * 12 **in** = 828 **in**

Divide both top and bottom by the unit **yd** * **ft** and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 23 yd = 828 in.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

- 57608

How many miles are 26400 yards?
You may use the conversion formula 1 ft = 5280 mi.
* Number of miles goes from 2 to 21.

Assistment #57608 "57608 - Conversion: x yd to mi"
How many miles are %v{x} yards?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

%v{x/1760}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

  The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

- Here will be presented two methods to conceptualize this problem.

  First method:
  Since 5280 ft = mi, the inverse, 1 ft = 1/5280 mi, is also true.

  Replacing this in the formula

  %v{x} yd = %v{x} * 1 yd = %v{x} * 3 ft = %v{x*3} ft = %v{x*3} * 1 ft,

  you get

  %v{x} * 1 yd = %v{x*3} * 1/5280 yd = %v{x*3}/5280 yd = %v{x/1760} yd.

  Second method:
  In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{1\ mi}}{\mathbf{5280\ ft}} = \frac{\mathbf{3\ ft}}{\mathbf{1\ yd}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \mathbf{yd} = \frac{\mathbf{\%v\{x\}\ yd * 1\ mi * 3\ ft}}{\mathbf{5280\ ft * 1\ yd}}$$

Now multiply the given number (%v{x} yd) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.

$$\%v\{x\}\ \mathbf{yd} = \frac{\mathbf{\%v\{x\} * 3\ mi}}{\mathbf{5280}} = \%v\{x/1760\}\ \mathbf{mi}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} yd = %v{x/1760} mi.
Type in %v{x/1760}.

Assistment #62171 "62171 - Conversion: x yd to mi"

How many miles are %v{x} yards?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ %v{x/1760}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

Here will be presented two methods to conceptualize this problem.

First method:
Since 5280 ft = mi, the inverse, 1 ft = 1/5280 mi, is also true.

Replacing this in the formula

%v{x} yd = %v{x} * 1 yd = %v{x} * 3 ft = %v{x*3} ft = %v{x*3} * 1 ft,

you get

%v{x} * 1 yd = %v{x*3} * 1/5280 yd = %v{x*3}/5280 yd = %v{x/1760} yd.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{1 mi}}{\textbf{5280 ft}} = \frac{\textbf{3 ft}}{\textbf{1 yd}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \textbf{yd} = \frac{\textbf{\%v\{x\} yd * 1 mi * 3 ft}}{\textbf{5280 ft * 1 yd}}$$

Now multiply the given number (%v{x} yd) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.

$$\%v\{x\}\ \textbf{yd} = \frac{\textbf{\%v\{x\} * 3 mi}}{\textbf{5280}} = \%v\{x/1760\}\ \textbf{mi}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} yd = %v{x/1760} mi.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65613 "65613 - 57608 - Conversion: x yd to mi"

How many miles are 3520 yards?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

2

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

- Here will be presented two methods to conceptualize this problem.

First method:
Since 5280 ft = mi, the inverse, 1 ft = 1/5280 mi, is also true.

Replacing this in the formula

3520 yd = 3520 * 1 yd = 3520 * 3 ft = 10560 ft = 10560 * 1 ft,

you get

3520 * 1 yd = 10560 * 1/5280 yd = 10560/5280 yd = 2 yd.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{1\ mi}}{\mathbf{5280\ ft}} = \frac{\mathbf{3\ ft}}{\mathbf{1\ yd}}$$

Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$3520\ \mathbf{yd} = \frac{\mathbf{3520\ yd * 1\ mi * 3\ ft}}{\mathbf{5280\ ft * 1\ yd}}$$

Now multiply the given number (3520 yd) by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.

$$3520\ \mathbf{yd} = \frac{\mathbf{3520 * 3\ mi}}{\ } = 2\ \mathbf{mi}$$

Divide both top and bottom by the unit ft and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which

5280 has no units.

Both methods show that 3520 yd = 2 mi.
Type in 2.

Assistment #65791 "65791 - 62171 - Conversion: x yd to mi"

How many miles are 28160 yards?

You may use the conversion formula 1 ft = 5280 mi.

Algebra:

✓ 16

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 5280 ft. = 1 mi.

Here will be presented two methods to conceptualize this problem.

First method:
Since 5280 ft = mi, the inverse, 1 ft = 1/5280 mi, is also true.

Replacing this in the formula

28160 yd = 28160 * 1 yd = 28160 * 3 ft = 84480 ft = 84480 * 1 ft,

you get

28160 * 1 yd = 84480 * 1/5280 yd = 84480/5280 yd = 16 yd.

Second method:
In this method, the units are treated similar to numbers.

$1 = \dfrac{\mathbf{1\ mi}}{\mathbf{5280\ ft}} = \dfrac{\mathbf{3\ ft}}{\mathbf{1\ yd}}$	Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$28160\ \mathbf{yd} = \dfrac{\mathbf{28160\ yd * 1\ mi * 3\ ft}}{\mathbf{5280\ ft * 1\ yd}}$	Now multiply the given number (28160 yd) by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 results in the original number, the left hand side remains the same.
$28160\ \mathbf{yd} = \dfrac{\mathbf{28160 * 3\ mi}}{\mathbf{5280}} = 16\ \mathbf{mi}$	Divide both top and bottom by the unit ft and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 28160 yd = 16 mi.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57609

How many yards are 468 inches?
* Number of yards goes from 2 to 36.

Assistment #57609 "57609 - Conversion: x in to yd"
How many yards are %v{x} inches?

Algebra:

✓ %v{x/36}

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint

2 pint = 1 quart
4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

  The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

- Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
%v{x} in = %v{x} * 1 in = %v{x} * 1/12 ft = %v{x/12} ft = %v{x/12} * 1 ft = %v{x/12} / 3 yd = %v{x/36} yd.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{1 yd}}{\textbf{3 ft}} = \frac{\textbf{1 ft}}{\textbf{12 in}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \text{in} = \frac{\textbf{\%v\{x\} in * 1 ft * 1 yd}}{\textbf{12 in * 3 ft}}$$

Now multiply the given number (%v{x} yd) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.

$$\%v\{x\}\ \text{in} = \frac{\textbf{\%v\{x\} yd}}{\textbf{12 * 3}} = \%v\{x/36\}\ \textbf{yd}$$

Divide both top and bottom by the unit **in** * **ft** and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} in = %v{x/36} yd.
Type in %v{x/36}.

Assistment #60294 "60294 - Conversion: x in to yd"
How many yards are %v{x} inches?
Algebra:

✓ %v{x/36}

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
%v{x} in = %v{x} * 1 in = %v{x} * 1/12 ft = %v{x/12} ft = %v{x/12} * 1 ft = %v{x/12} / 3 yd = %v{x/36} yd.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{1\ yd}}{\mathbf{3\ ft}} = \frac{\mathbf{1\ ft}}{\mathbf{12\ in}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$\%v\{x\}\ \mathbf{in} = \frac{\mathbf{\%v\{x\}\ in * 1\ ft * 1\ yd}}{\mathbf{12\ in * 3\ ft}}$$

Now multiply the given number (%v{x} yd) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to

$$\%v\{x\}\ \mathbf{in} = \frac{\%v\{x\}\ \mathbf{yd}}{12 * 3} = \%v\{x/36\}\ \mathbf{yd}$$

itself, the left hand side remains the same.

Divide both top and bottom by the unit **in** * **ft** and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} in = %v{x/36} yd.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65647 "65647 - 57609 - Conversion: x in to yd"

How many yards are 432 inches?

Algebra:

✓ 12

Hints:

- The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in. = 1 ft.	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft. = 1yd.		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

- To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

- Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
432 in = 432 * 1 in = 432 * 1/12 ft = 36 ft = 36 * 1 ft = 36 / 3 yd = 12 yd.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{1\ yd}}{\mathbf{3\ ft}} = \frac{\mathbf{1\ ft}}{\mathbf{12\ in}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same

		number maintains the equality. Dividing any number by itself results in 1.
432 in =	$\frac{432 \text{ in} * 1 \text{ ft} * 1 \text{ yd}}{12 \text{ in} * 3 \text{ ft}}$	Now multiply the given number (432 yd) by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.
432 in =	$\frac{432 \text{ yd}}{12 * 3}$ = 12 yd	Divide both top and bottom by the unit in * ft and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 432 in = 12 yd.
Type in 12.

Assistment #65729 "65729 - 60294 - Conversion: x in to yd"

How many yards are 72 inches?

Algebra:

✓ 2

Scaffold:

Here is a complete explanation:

The typical conversion formulae used in modern times for the old English system of measurement are:

Distance	Mass	Volume
12 in = 1 ft	16 oz. = 1 lb.	3 tsp. = 1 tbsp.
3 ft = 1 yd		2 tbsp. = 1 oz.
5280 ft. = 1 mi.		8 oz. = 1 cup
		2 cup = 1 pint
		2 pint = 1 quart
		4 quarts = 1 gallon

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 3 ft. = 1 yd. and 12 in. = 1 ft.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get:
72 in = 72 * 1 in = 72 * 1/12 ft = 6 ft = 6 * 1 ft = 6 / 3 yd = 2 yd.

Second method:
In this method, the units are treated similar to numbers.

$1 = \dfrac{\mathbf{1\ yd}}{\mathbf{3\ ft}} = \dfrac{\mathbf{1\ ft}}{\mathbf{12\ in}}$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$72\ \mathbf{in} = \dfrac{\mathbf{72\ in * 1\ ft * 1\ yd}}{\mathbf{12\ in * 3\ ft}}$

Now multiply the given number (72 yd) by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since multiplying any number by 1 is equal to itself, the left hand side remains the same.

$72\ \mathbf{in} = \dfrac{\mathbf{72\ yd}}{\mathbf{12 * 3}} = 2\ \mathbf{yd}$

Divide both top and bottom by the unit **in** * **ft** and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 72 in = 2 yd.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57644

How many seconds are in 6 hours?
* Number of hours goes from 2 to 16.

Assistment #57603 "57603 - Conversion: hr to s"
How many seconds are in an hour?

Algebra:

✓ 3600

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	

60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- To determine the conversion formulae not on the table, use multiple conversions.

  The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

- Here will be presented two methods to conceptualize this problem.

  First method:
  Placing one formula in the other, you get 1 hr = 60 min = 60 * 1 min = 60 * 60 s = 3600 s.

  Second method:
  In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{60\ min}}{\mathbf{1\ hr}} = \frac{\mathbf{60\ s}}{\mathbf{1\ min}}$$

Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$1 = \frac{\mathbf{60\ min * 60\ s}}{\mathbf{1\ hr * 1\ min}}$$

Now multiply the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since 1*1 = 1, the left hand side remains the same.

$$1 = \frac{\mathbf{60 * 60\ s}}{\mathbf{1\ hr}} = 3600 \frac{\mathbf{s}}{\mathbf{hr}}$$

Divide both top and bottom by the unit min and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that there are 3600 seconds per hour.
The conversion formula is 1 hr = 3600 s.
Type in 3600.

Assistment #60295 "60295 - Conversion: x hr to s"
How many seconds are in %v{x} hours?

Algebra:

%v{x*3600}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get
%v{x} hr = %v{x} * 1 hr = %v{x} * 60 min = %v{x*60} min = %v{x*60} * 1 min = %v{x*60} * 60 s = %v{x*3600} s.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\textbf{60 min}}{} = \frac{\textbf{60 s}}{}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an

1 hr **1 min**		equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} **hr** = %v{x} **hr** *	$\frac{\mathbf{60\ min * 60\ s}}{\mathbf{1\ hr * 1\ min}}$	Now multiply the given number by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.
%v{x} **hr** = %v{x} * 60 * 60 **s** = %v{x*3600} **s**		Divide both top and bottom by the unit hr * min and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} hr = %v{x*3600} s.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65701 "65701 - 57644 - Conversion: x hr to s"

How many seconds are in 13 hours?

Algebra:

✓ 46800

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

- Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get
13 hr = 13 * 1 hr = 13 * 60 min = 780 min = 780 * 1 min = 780 * 60 s = 46800 s.

Second method:
In this method, the units are treated similar to numbers.

$1 = \dfrac{\mathbf{60\ min}}{\mathbf{1\ hr}} = \dfrac{\mathbf{60\ s}}{\mathbf{1\ min}}$	Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
$13\ \mathbf{hr} = 13\ \mathbf{hr} * \dfrac{\mathbf{60\ min * 60\ s}}{\mathbf{1\ hr * 1\ min}}$	Now multiply the given number by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.
$13\ \mathbf{hr} = 13 * 60 * 60\ \mathbf{s} = 46800\ \mathbf{s}$	Divide both top and bottom by the unit hr * min and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 13 hr = 46800 s.
Type in 46800.

Assistment #65775 "65775 - 60295 - Conversion: x hr to s"

How many seconds are in 7 hours?

Algebra:

✓ 25200

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	

24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get
7 hr = 7 * 1 hr = 7 * 60 min = 420 min = 420 * 1 min = 420 * 60 s = 25200 s.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{60\ min}}{\mathbf{1\ hr}} = \frac{\mathbf{60\ s}}{\mathbf{1\ min}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$7\ \mathbf{hr} = 7\ \mathbf{hr} * \frac{\mathbf{60\ min * 60\ s}}{\mathbf{1\ hr * 1\ min}}$$

Now multiply the given number by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.

$$7\ \mathbf{hr} = 7 * 60 * 60\ \mathbf{s} = 25200\ \mathbf{s}$$

Divide both top and bottom by the unit hr * min and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 7 hr = 25200 s.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

- 57648

How many hours are 41400 seconds?
* Number of hours goes from 1 to 13 in half hour steps.

Assistment #57648 "57648 - Conversion: x s to hr"
How many hours are %v{x} seconds?
Algebra:
✓ %v{x/3600}
Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- To determine the conversion formulae not on the table, use multiple conversions.

  The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.
- Here will be presented two methods to conceptualize this problem.

  First method:
  Placing one formula in the other, you get
  %v{x} s = %v{x} * 1 s = %v{x}/60 min = %v{x/60} min = %v{x/60} * 1 min
  = %v{x/60}/60 hr = %v{x/3600} hr.

  Second method:
  In this method, the units are treated similar to numbers.

1 = **1 min** = **1 hr**	Write conversion formulae as fractions by dividing one side by the other.

60 s 60 min

%v{x} s = %v{x} s * $\frac{1 \text{ min} * 1 \text{ hr}}{60 \text{ s} * 60 \text{ min}}$

This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

Now multiply the given number by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.

%v{x} s = $\frac{\text{%v\{x\} hr}}{60 * 60}$ = %v{x/3600} hr

Divide both top and bottom by the unit s * min and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} s = %v{x/3600} hr.
Type in %v{x/3600}.

Assistment #60296 "60296 - Conversion: x s to hr"
How many hours are %v{x} seconds?

Algebra:

✓ %v{x/3600}

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days =	This is based on the usual average of the number of days in a month in the modern

1 month	solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get
%v{x} s = %v{x} * 1 s = %v{x}/60 min = %v{x/60} min = %v{x/60} * 1 min = %v{x/60}/60 hr = %v{x/3600} hr.

Second method:
In this method, the units are treated similar to numbers.

$1 = \dfrac{\mathbf{1\ min}}{\mathbf{60\ s}} = \dfrac{\mathbf{1\ hr}}{\mathbf{60\ min}}$	Write conversion formulae as fractions by dividing one side by the other. This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.
%v{x} **s** = %v{x} **s** * $\dfrac{\mathbf{1\ min * 1\ hr}}{\mathbf{60\ s * 60\ min}}$	Now multiply the given number by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.
%v{x} **s** = $\dfrac{\textbf{\%v\{x\} hr}}{\mathbf{60 * 60}}$ = %v{x/3600} **hr**	Divide both top and bottom by the unit s * min and simplify. Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that %v{x} s = %v{x/3600} hr.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Assistment #65662 "65662 - 57648 - Conversion: x s to hr"

How many hours are 39600 seconds?

Algebra:

✓ 11

Hints:

- Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

- To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

- Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get
39600 s = 39600 * 1 s = 39600/60 min = 660 min = 660 * 1 min = 660/60 hr = 11 hr.

Second method:
In this method, the units are treated similar to numbers.

$1 = \frac{\textbf{1 min}}{\textbf{60 s}} = \frac{\textbf{1 hr}}{\textbf{60 min}}$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$39600 \text{ s} = 39600 \text{ s} * \frac{\textbf{1 min * 1 hr}}{\textbf{60 s * 60 min}}$

Now multiply the given number by the two conversion formulae. Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.

$39600 \text{ s} = \textbf{39600 hr} = 11 \text{ hr}$

Divide both top and bottom by the unit s * min and simplify.

$\overline{60 * 60}$	Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 39600 s = 11 hr.
Type in 11.

Assistment #65717 "65717 - 60296 - Conversion: x s to hr"

How many hours are 32400 seconds?

Algebra:

✓ 9

Scaffold:

Here is a complete explanation:

Typical conversion factors for measurement of time is given in the table below.

Time	Notes
60 s = 1 min	
60 min = 1 hr	
24 hr = 1 day	Since the earth's rotation defines a day and the second is based on an atomic process, this number is not exact. It was defined to be exact at one point in time, however.
7 days = 1 week	
30 days = 1 month	This is based on the usual average of the number of days in a month in the modern solar calander. This is not an exact number, and the actual revolution time for the moon, the original definition of a month, is about 27.3 days.
365 days = 1 year	Actually, it is closer to 1 year = 365.24 days - it measures the length of time for earth's revolution around the sun.

To determine the conversion formulae not on the table, use multiple conversions.

The table above gives the formulae 60 s = 1 min and 60 min = 1 hr.

Here will be presented two methods to conceptualize this problem.

First method:
Placing one formula in the other, you get
32400 s = 32400 * 1 s = 32400/60 min = 540 min = 540 * 1 min = 540/60 hr = 9 hr.

Second method:
In this method, the units are treated similar to numbers.

$$1 = \frac{\mathbf{1\ min}}{\mathbf{60\ s}} = \frac{\mathbf{1\ hr}}{\mathbf{60\ min}}$$

Write conversion formulae as fractions by dividing one side by the other.
This is valid since dividing both sides of an equation by the same number maintains the equality. Dividing any number by itself results in 1.

$$32400\ \mathbf{s} = 32400\ \mathbf{s} * \frac{\mathbf{1\ min * 1\ hr}}{\mathbf{60\ s * 60\ min}}$$

Now multiply the given number by the two conversion formulae.
Since as shown in the previous step each conversion formula is equal to 1, this involves multiplying both sides by 1. Since any number multiplied by 1 is equal to itself, the left hand side remains the same.

$$32400\ \mathbf{s} = \frac{\mathbf{32400\ hr}}{\mathbf{60 * 60}} = 9\ \mathbf{hr}$$

Divide both top and bottom by the unit s * min and simplify.
Just as a number divided by itself is 1, a unit divided by itself is 1, which has no units.

Both methods show that 32400 s = 9 hr.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Appendix D: Area and Perimeter ASSISTments

Original Content Created by Ruowang Li

Show main problems.

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Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Assistment #55910 "55910 - Area of the circle using radius"

What is the area of the circle with the radius of %v{radius}? (use 3.14 for ∏)

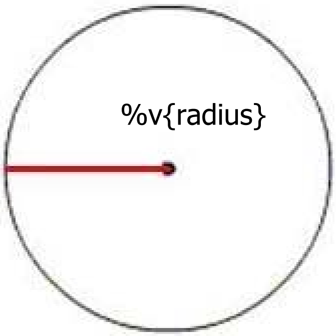


image not to scale

Algebra:

%v{answer}

Scaffold:

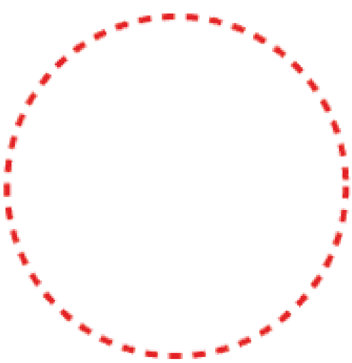
Which one is the correct formula to calculate the area of the circle?

Multiple choice:

- area = ∏ * $(\text{radius})^2$
- area = ∏ * radius
- area = 2∏ * radius
- area = radius^2

Hints:

- The area of the circle is the region it occupies. Don't confuse it with the circumference.

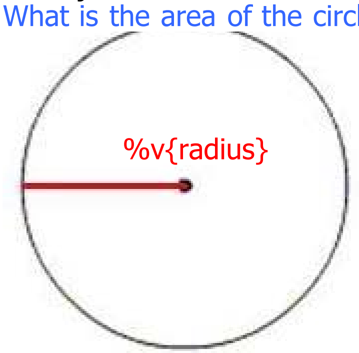


- The formula for calculating the of area the circle is ∏ * (radius)^2

Scaffold:

Good job! Let's take a look at the original problem

What is the area of the circle with the radius of %v{radius}? (use 3.14 for ∏)



Fill in:

✓ %v{answer}

Hints:

- The radius of the circle is %v{radius}

Area = ∏ * radius^2 Let's substitute it in the formula from last step:

Area = 3.14 * %v{radius}^{2}

Area = 3.14 * %v{radius*radius}

- The area of the circle is %v{answer}

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60097 "60097 - 58787 - Area of the rectangle with base and height"

What is the area of the rectangle with base of %v{base} and height of %v{height}?

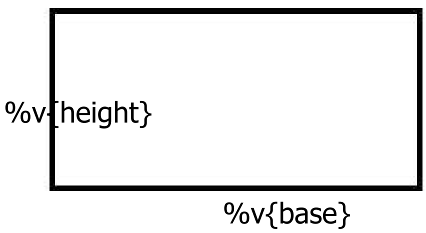


image not to scale

Algebra:

%v{answer}

Scaffold:

The area of the rectangle is the region it occupies. Don't confuse it with the perimeter.

The formula for calculating the of area the rectangle is
base*height

The base of the rectangle is %v{base}
The height of the rectangle is
%v{height}

Area = base * height Let's substitute it in the formula from last step

Area = %v{base} * %v{height} Now multiply

Area = %v{answer}

The area of the rectangle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem Drag edit delete

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Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60098 "60098 - 58838 - base from area of rectangle"

What is the base of the rectangle with area of %v{area} and height of %v{height}?

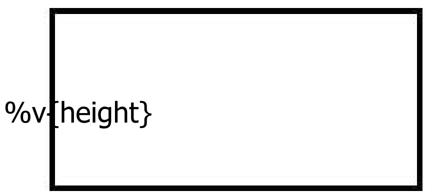

image not to scale

Algebra:

%v{base}

Scaffold:

Here is a complete explanation

The area of the rectangle is the region it occupies. Don't confuse it with the perimeter.

The formula for calculating the of area the rectangle is base*height

The area of the rectangle is %v{area}
The height of the rectangle is %v{height}

Area = base * height	Let's substitute it in the formula from last step
%v{area} = base * %v{height}	Now divide
%v{base} = base	

The base of the rectangle is %v{base}

Multiple choice:

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60099 "60099 - 58839 - height from area of rectangle"

What is the height of the rectangle with area of %v{area} and base of %v{base}?

%v{base}

image not to scale

Algebra:

✓ %v{height}

Hints:

- The area of the rectangle is the region it occupies. Don't confuse it with the perimeter.

The formula for calculating the of area the rectangle is base*height

The area of the rectangle is %v{area}
The base of the rectangle is %v{base}

Area = base * height	Let's substitute it in the formula from last step
%v{area} = %v{base} * height	Now divide
%v{height} = height	

The height of the rectangle is %v{height}

Show main problems.

Show main problems, answers, and all tutoring.

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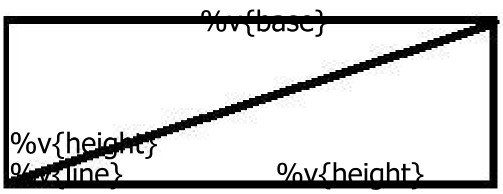
☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60100 "60100 - 60094 - Area of the rectangle with base and height"

What is the area of the rectangle with the given information?



%v{base}

image not to scale

Algebra:

✓ %v{answer}

✗ %v{2*base+2*height}

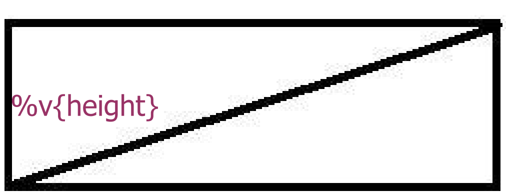
Scaffold:

Here is a complete explanation.

The area of the rectangle is the region it occupies. Don't confuse it with the perimeter.

The formula for calculating the of area the rectangle is base*height

%v{base}



The base of the rectangle is %v{base}
The height of the rectangle is %v{height}

Area =	base * height	Let's substitute it in the formula from last step
Area =	%v{base} * %v{height}	Now multiply
Area =	%v{answer}	

The area of the rectangle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.

Show main problems, answers, and all tutoring.

Show main problems and your choice of tutoring.

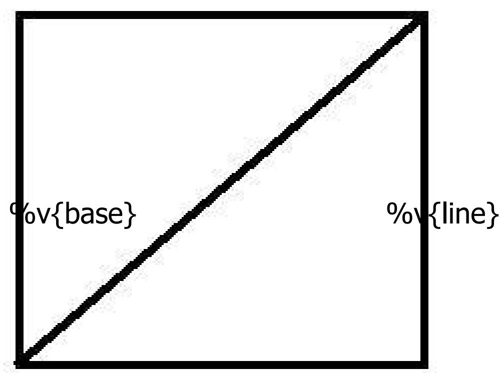
Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60101 "60101 - 60095 - Area of the square "

What is the area of the square with the given information?



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Algebra:

✓ %v{answer}

✗ %v{4*base}

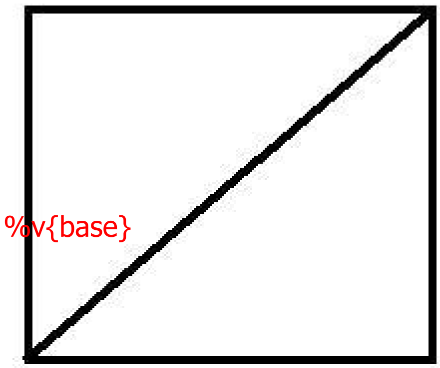
Hints:

- Here is a complete explanation.

A square is a special form of a rectangle with all of its sides equal. So we can use the area formula for rectangle to calculate the area of a square.

The area of the square(rectangle) is the region it occupies. Don't confuse it with the perimeter.

The formula for calculating the area of the square(rectangle) is base*height



The side of the square is %v{base}
Because a square is a special rectangle with four sides equal, base = height = side = %v{base}

Area = base * height	base = height = side
Area = side * side	Let's substitute it in the formula from last step
Area = %v{base} * %v{base}	Now multiply

The area of the square is %v{answer}

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Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60102 "60102 - 58264 - Area of the triangle with base and height"

What is the area of the triangle with base of %v{base} and height of %v{height}?

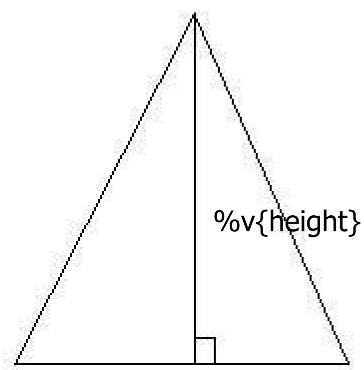


image not to scale

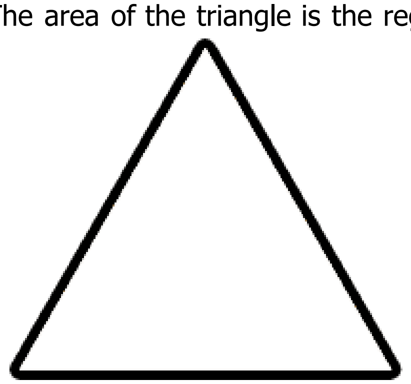
Algebra:

✓ %v{answer}

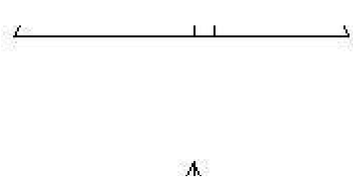
Scaffold:

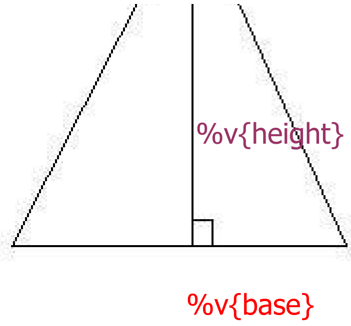
Here is a complete explanation.

The area of the triangle is the region it occupies. Don't confuse it with the perimeter.



The formula for calculating the area of the triangle is 1/2*base*height





The base of the triangle is %v{base}
The height of the triangle is %v{height}

Area = 1/2 * base * height	Let's substitute it in the formula from last step
Area = 1/2* %v{base} * %v{height}	Now multiply
Area = 1/2 * %v{base*height}	
Area = %v{answer}	

The area of the triangle is %v{answer}
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60103 "60103 - 58266 - Area of the right triangle with base and height"

What is the area of the right triangle with one leg of %v{side1} and another leg of %v{side2}?

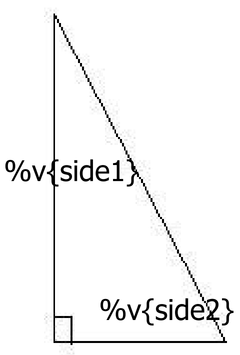


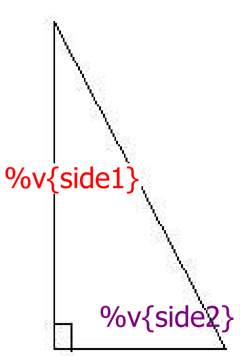
image not to scale

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation.



The base of the triangle is %v{side2}
The height of the triangle is %v{side1}

Area = 1/2 * base * height	Substitute it in the formula from last step
Area = 1/2 * %v{side2} * %v{side1}	Now multiply

Area = 1/2 * %v{side2*side1}
Area = %v{answer}

The area of the triangle is %v{answer}
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60104 "60104 - 58271 - base from area of triangle"

The area of the triangle is %v{area} and the height is %v{height}. What is the base of the triangle?

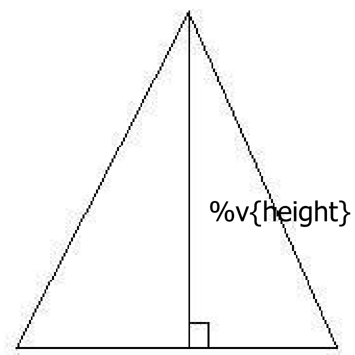


image not to scale

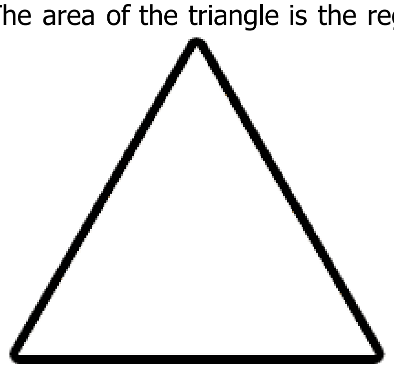
Algebra:

%v{base}

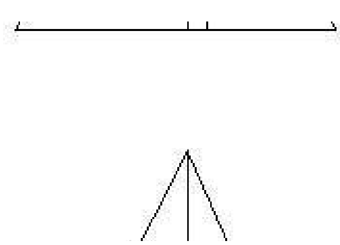
Scaffold:

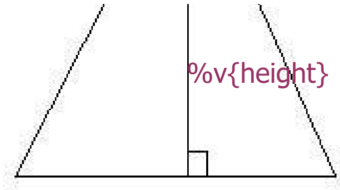
Here is a complete explanation.

The area of the triangle is the region it occupies. Don't confuse it with the perimeter.



The formula for calculating the area of the triangle is 1/2*base*height





The height of the triangle is %v{height}
The area of the triangle is %v{area}

From here, we need to use the equation from last step and work backwards to get the base of the triangle

Area = 1/2 * base * height
%v{area} = 1/2 * base * %v{height} Substitute in the numbers
%v{area} = base * %v{height*0.5} Now divide
%v{area} / %v{height*0.5} = base
%v{base} = base

The base of the triangle is %v{base}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.

Show main problems, answers, and all tutoring.

Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60105 "60105 - 58784 - height from area of triangle"

The area of the triangle is %v{area} and the base is %v{base}. What is the height of the triangle?

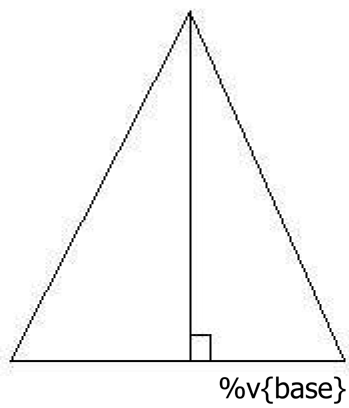


image not to scale

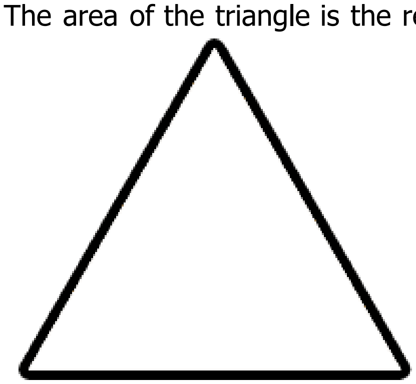
Algebra:

%v{height}

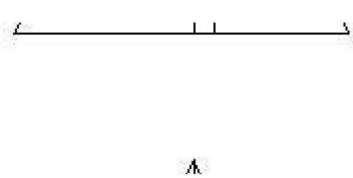
Scaffold:

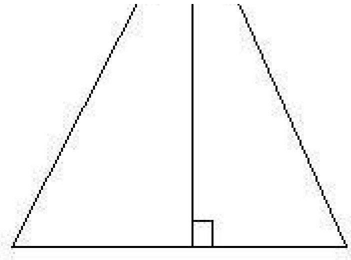
Here is a complete explanation.

The area of the triangle is the region it occupies. Don't confuse it with the perimeter.



The formula for calculating the area of the triangle is 1/2*base*height





%v{base}

The base of the triangle is %v{base}
The area of the triangle is %v{area}

From here, we need to use the equation from last step and work backwards to get the height of the triangle

Area = 1/2 * base * height
%v{area} = 1/2 * %v{base} * height Substitute in the numbers
%v{area} = %v{base*0.5} * height Now divide
%v{area} / %v{base*0.5} = height
%v{height} = height

The height of the triangle is %v{height}

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60106 "60106 - 60091 - Area of the triangle with base and height"

What is the area of the triangle with base of %v{base} and height of %v{height}?

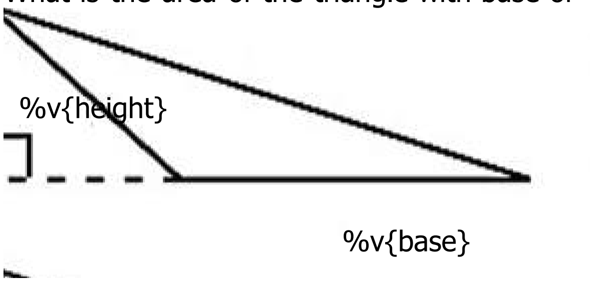


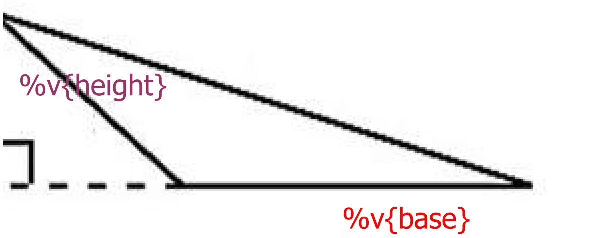
image not to scale

Algebra:

✓ %v{answer}

Scaffold:

The formula for calculating the area of the triangle is 1/2*base*height



The base of the triangle is %v{base}
The height of the triangle is %v{height}

Area = 1/2 * base * height Let's substitute it in the formula from last step:
Area = 1/2* %v{base} * %v{height} Now multiply
Area = 1/2 * %v{base*height}
Area = %v{answer}

The area of the triangle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60107 "60107 - 60092 - Area of the triangle with base and height"

What is the area of the triangle with given information?

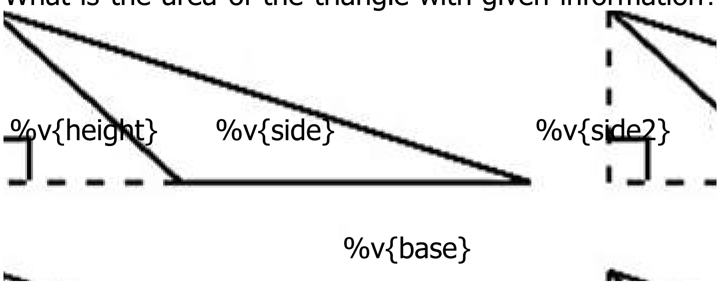


image not to scale

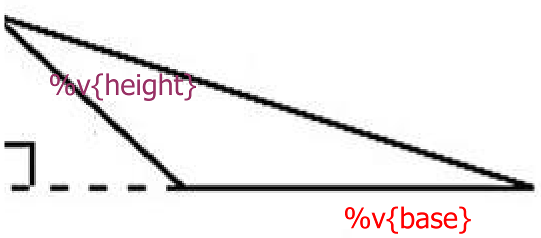
Algebra:

✓ %v{answer}

✗ %v{base+side+side2}

Scaffold:

The formula for calculating the area of the triangle is 1/2*base*height



The base of the triangle is %v{base}
The height of the triangle is %v{height}

Area = 1/2 * base * height Let's substitute it in the formula from last step:
Area = 1/2* %v{base} * %v{height} Now multiply
Area = 1/2 * %v{base*height}
Area = %v{answer}

The area of the triangle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60650 "60650 - Area of the Parallelogram with base and height"

What is the area of the parallelogram the given information?

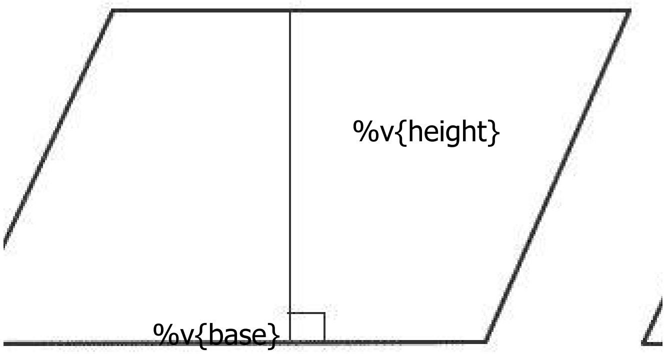


image not to scale

Algebra:

%v{answer}

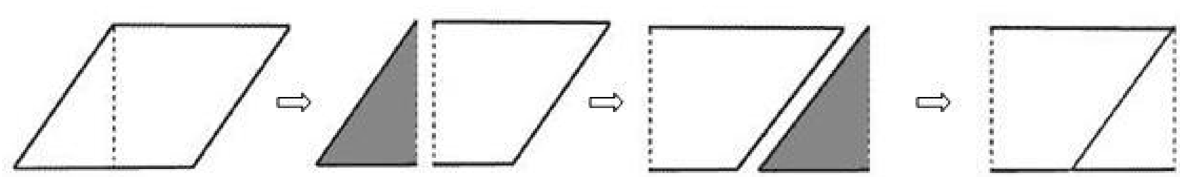
Scaffold:

Here is a complete explanation

The area of the parallelogram is the region it occupies.

The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting



The base of the parallelogram is %v{base}
The height of the parallelogram is %v{height}

Area = base * height	Let's substitute it in the formula from last step
Area = %v{base} * %v{height}	Now multiply
Area = %v{answer}	

The area of the rectangle is %v{answer}, therefore the area of the rectange is also %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60651 "60651 - Area of the Parallelogram with base and height"

What is the area of the parallelogram the given information?

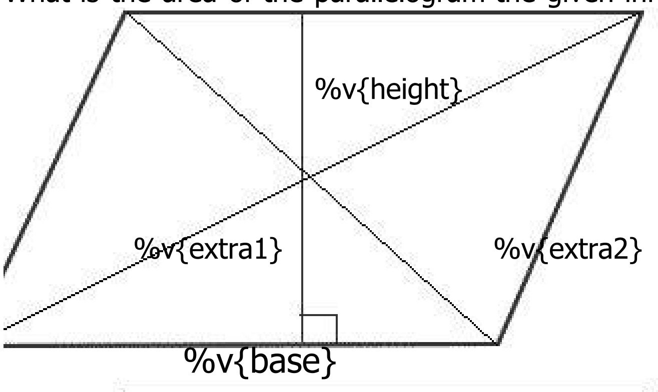


image not to scale

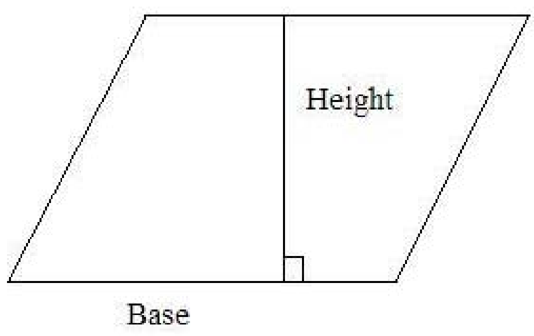
Algebra:

%v{answer}

Scaffold:

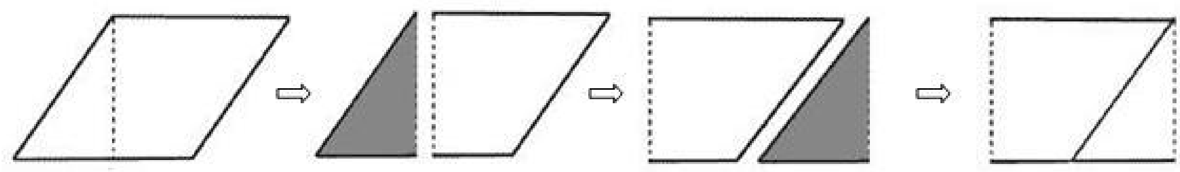
Here is a complete explanation

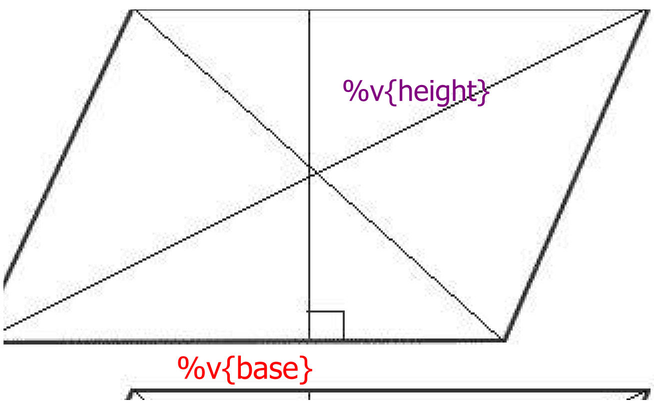
The area of the parallelogram is the region it occupies.



The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting





The base of the parallelogram is %v{base}
The height of the parallelogram is %v{height}

Area = base * height	Let's substitute it in the formula from last step
Area = %v{base} * %v{height}	Now multiply
Area = %v{answer}	

The area of the rectangle is %v{answer}, therefore the area of the parallelogram is also %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60652 "60652 - Area of the Parallelogram with base and height"

What is the area of the parallelogram the given information?

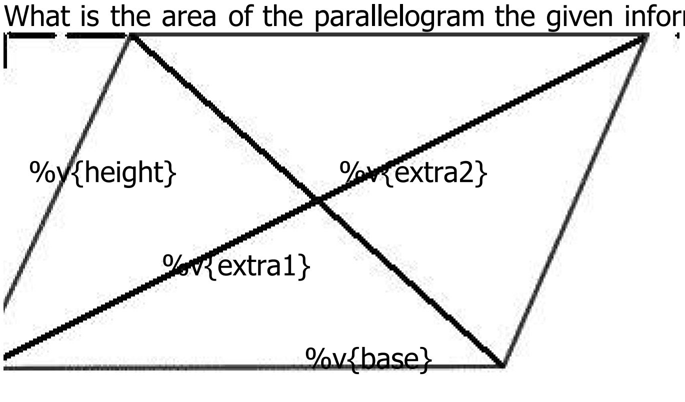


image not to scale

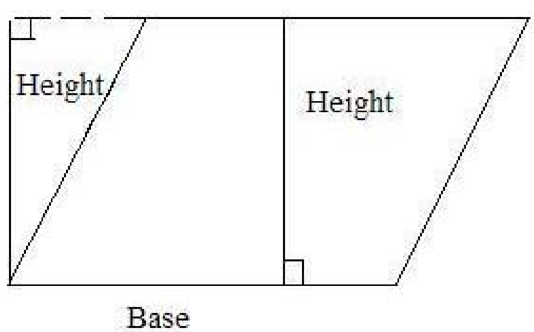
Algebra:

✓ %v{answer}

Scaffold:

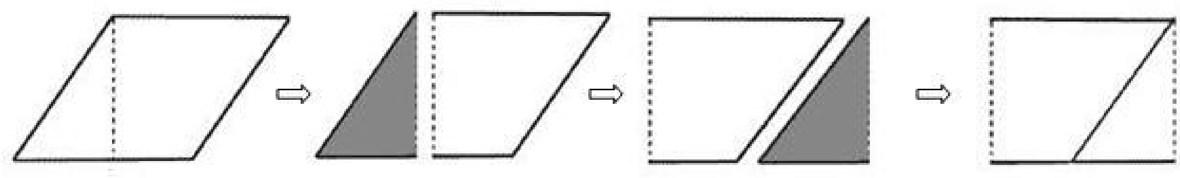
Here is a complete explanation.

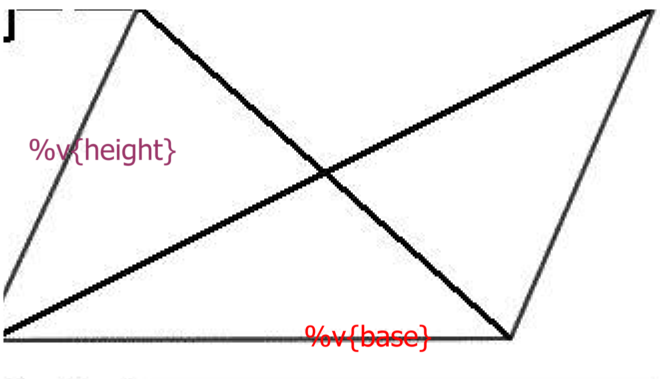
The area of the parallelogram is the region it occupies.



The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting





The base of the parallelogram is %v{base}
The height of the parallelogram is %v{height}

Area = base * height	Let's substitute it in the formula from last step
Area = %v{base} * %v{height}	Now multiply
Area = %v{answer}	

The area of the rectangle is %v{answer}, therefore the area of the parallelogram is also %v{answer}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.

Show main problems, answers, and all tutoring.

Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60653 "60653 - Area of Trapezoid"

What is the area of the trapezoid with the given information?

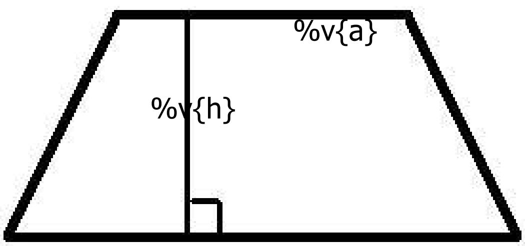


image not to scale

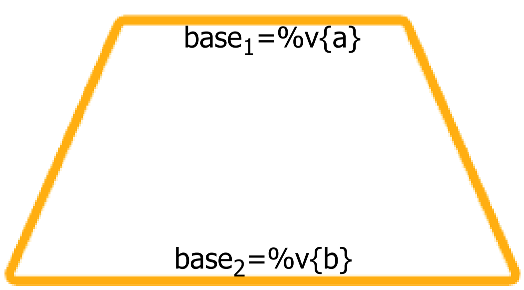
Algebra:

✓ %v{(a+b)*h/2}

Scaffold:

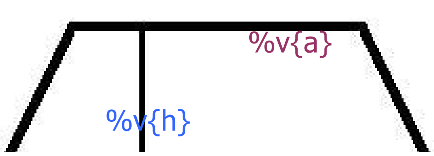
Here is a complete explanation.

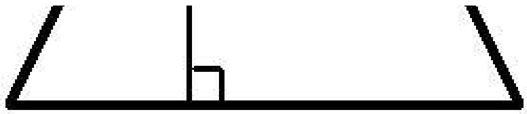
The area of the trapezoid is the region it occupies.



The area of the trapezoid is calculated by the following formula:

$$\text{Area of Trapezoid} = \frac{1}{2} * (\text{base}_1 + \text{base}_2) * \text{height}$$





%v{b}

The base1 of the trapezoid is %v{a}
The base2 of the trapezoid is %v{b}
The height of the trapezoid is %v{h}

$$
\begin{aligned}
\text{Area of trapzoid} &= \frac{1}{2} * (base_1 + base_2) * height \\
&= \frac{1}{2} * (\%v\{a\} + \%v\{b\}) * \%v\{h\} \\
&= \frac{1}{2} * \%v\{a+b\} * \%v\{h\} \\
&= \frac{1}{2} * \%v\{(a+b)*h\} \\
&= \%v\{(a+b)*h/2\}
\end{aligned}
$$

The area of the trapzoid is %v{h*(b+a)/2}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60654 "60654 - Area of Trapezoid"

What is the area of the trapezoid with the given information?

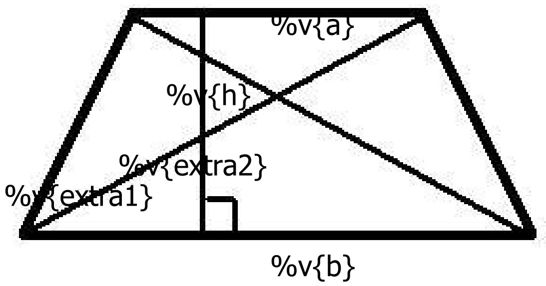


image not to scale

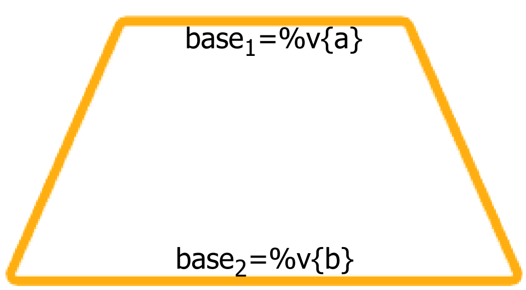
Algebra:

%v{(a+b)*h/2}

Scaffold:

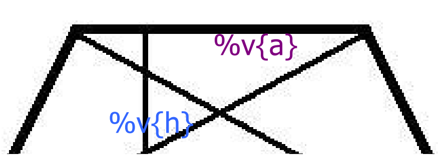
Here is a complete explanation.

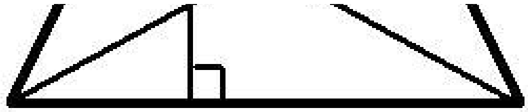
The area of the trapezoid is the region it occupies.



The area of the trapezoid is calculated by the following formula:

$$\text{Area of Trapezoid} = \frac{1}{2} * (\text{base}_1 + \text{base}_2) * \text{height}$$





The base1 of the trapezoid is %v{a}
The base2 of the trapezoid is %v{b}
The height of the trapezoid is %v{h}
No other information is needed.

$$\text{Area of trapzoid} = \frac{1}{2} * (\text{base}_1 + \text{base}_2) * \text{height}$$
$$= \frac{1}{2} * (\%v\{a\} + \%v\{b\}) * \%v\{h\}$$
$$= \frac{1}{2} * \%v\{a+b\} * \%v\{h\}$$
$$= \frac{1}{2} * \%v\{(a+b)*h\}$$
$$= \%v\{(a+b)*h/2\}$$

The area of the trapzoid is %v{h*(b+a)/2}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60701 "60701 - Area of Trapezoid"

What is the area of the trapezoid with the given information?

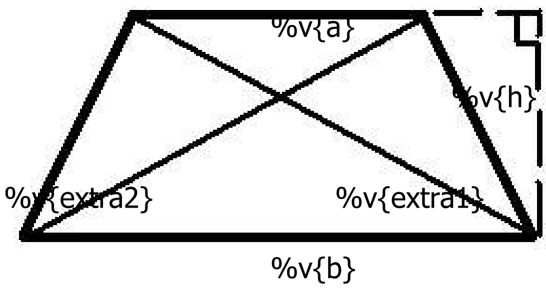


image not to scale

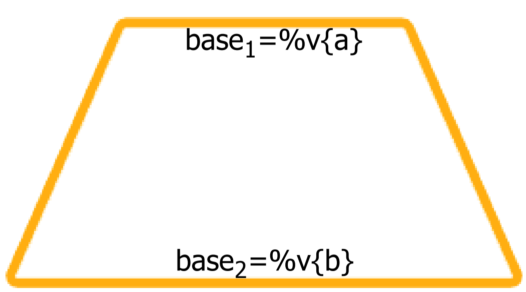
Algebra:

%v{(a+b)*h/2}

Scaffold:

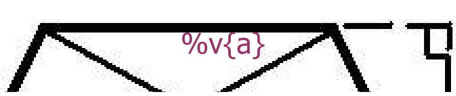
Here is a complete explanation.

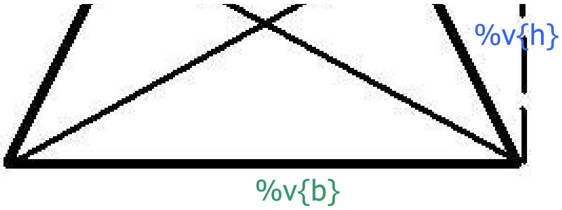
The area of the trapezoid is the region it occupies.



The area of the trapezoid is calculated by the following formula:

$$\text{Area of Trapezoid} = \frac{1}{2} * (base_1 + base_2) * height$$





The base1 of the trapezoid is %v{a}
The base2 of the trapezoid is %v{b}
The height of the trapezoid is %v{h}
No other information is needed.

$$\text{Area of trapzoid} = \frac{1}{2} * (\text{base}_1 + \text{base}_2) * \text{height}$$
$$= \frac{1}{2} * (\%v\{a\} + \%v\{b\}) * \%v\{h\}$$
$$= \frac{1}{2} * \%v\{a+b\} * \%v\{h\}$$
$$= \frac{1}{2} * \%v\{(a+b)*h\}$$
$$= \%v\{(a+b)*h/2\}$$

The area of the trapzoid is %v{h*(b+a)/2}.
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #60719 "60719 - Area of Trapezoid"

What is the area of the trapezoid with the given information?

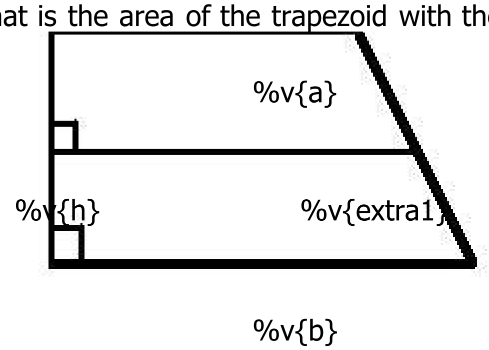


image not to scale

Algebra:

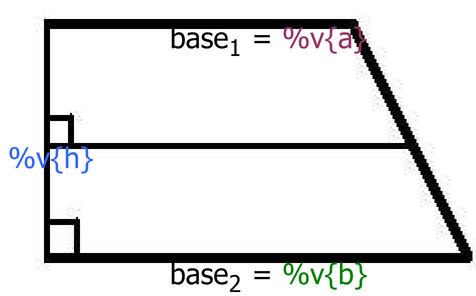
%v{(a+b)*h/2}

Scaffold:

Here is a complete explanation.

The area of the trapezoid is calculated by the following formula:

Area of Trapezoid $= \frac{1}{2} * (\text{base}_1 + \text{base}_2) * \text{height}$



The base1 of the trapezoid is %v{a}
The base2 of the trapezoid is %v{b}
The height of the trapezoid is %v{h}

No other information is needed.

$$\text{Area of trapzoid} = \frac{1}{2} * (\text{base}_1 + \text{base}_2) * \text{height}$$
$$= \frac{1}{2} * (\%v\{a\} + \%v\{b\}) * \%v\{h\}$$
$$= \frac{1}{2} * \%v\{a+b\} * \%v\{h\}$$
$$= \frac{1}{2} * \%v\{(a+b)*h\}$$
$$= \%v\{(a+b)*h/2\}$$

The area of the trapzoid is %v{h*(b+a)/2}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #62271 "62271 - Area of the circle using radius"

What is the area of the circle with the radius of %v{radius}? (use 3.14 for ∏)

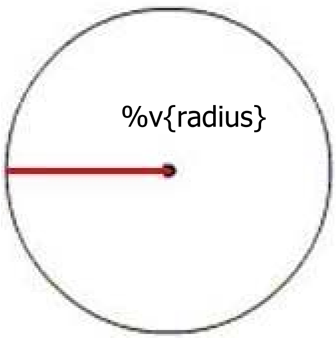


image not to scale

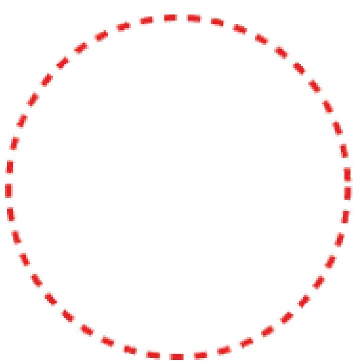
Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation.

The area of the circle is the region it occupies. Don't confuse it with the circumference.



The radius of the circle is %v{radius}

Area = ∏ * radius^2 Let's substitute it in the formula from last step:
Area = 3.14 * %v{radius}^{2}
Area = 3.14 * %v{radius*radius}

The area of the circle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers
If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #62272 "62272 - 55956 - Diameter from area of circle"
What is the diameter of the circle when the area of the circle is %v{area}? (use 3.14 for ∏)

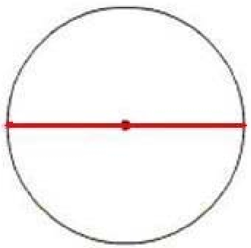
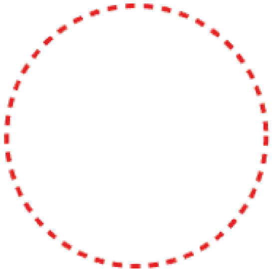


image not to scale
Algebra:
✓ %v{diameter}
✗ %v{diameter/2}
Scaffold:
Here is a complete explanation.
The area of the circle is the region it occupies. Don't confuse it with the circumference.



We need to find the radius from the area of the circle

Area = ∏ * (radius)^2 Let's substitute it in the formula
%v{area} = 3.14 * (radius)^2
%v{area} ÷ 3.14 = (radius)^2
%v{area/3.14} = (radius)^2
%v{area/3.14} = √(radius)^2
%v{radius}= radius

The diameter of the circle is twice as long as the radius.
diameter = 2 x radius
= 2 x %v{radius}

√

%

The diameter of the circle is diameter = %v{diameter}.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #62273 "62273 - 55937 - Area of circle using diameter"

What is the area of the circle with the diameter of %v{diameter}? (use 3.14 for ∏)

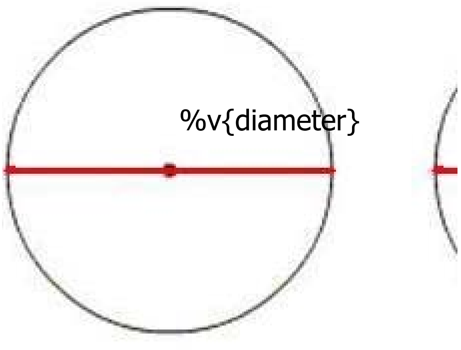


image not to scale

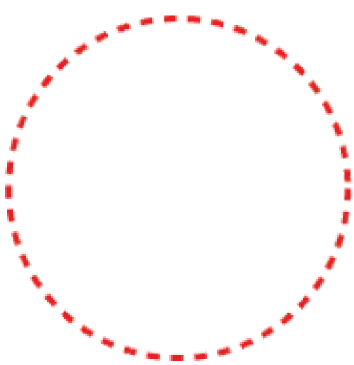
Algebra:

%v{answer}

Scaffold:

Here is a complete explanation

The Area of the circle is distance around the edge of the circle. Don't confuse it with the circumference.



We need to find the radius in order to calculate the area of the circle

The radius of the circle is diameter ÷ 2 = %v{diameter}

2
= %v{diameter*0.5}

Area = ∏ * (radius)^2 Let's subsititute it in the formula

Area = 3.14 * %v{diameter*0.5}^{2}

Area = 3.14 * %v{diameter*diameter*0.25}

Area = %v{answer}

The Area of the circle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #62275 "62275 - Radius from area of circle"

What is the radius of the circle when the area of the circle is %v{area}? (use 3.14 for ∏)

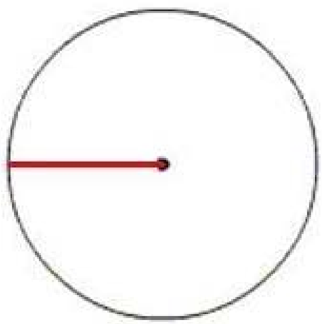


image not to scale

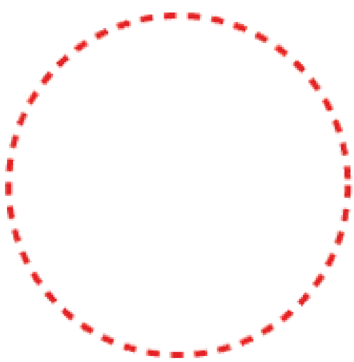
Algebra:

✓ %v{radius}

Scaffold:

Here is a complete explanation.

The area of the circle is the region it occupies. Don't confuse it with the circumference.



We need to find the radius from the area of the circle

Area = ∏ * (radius)^2 Let's subsititute it in the formula from last question
%v{area}= 3.14 * (radius)^2
%v{area} ÷ 3.14= (radius)^2
%v{area/3.14} = (radius)^2
√%v{area/3.14} = √(radius)^2

The radius of the circle is radius = %v{radius}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #62276 "62276 - 58787 - Area of the irregular figure"

What is the area of this object with given information? use 3.14 for ∏.

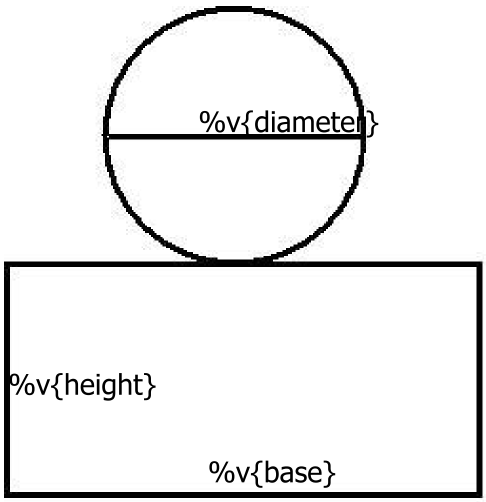


image not to scale

Algebra:

%v{answer}

Scaffold:

Here is a complete explanation

This object has two parts, the top part is a circle and the bottom part is a rectangle. We can get the area of the object by getting the area of the two parts and add them together.

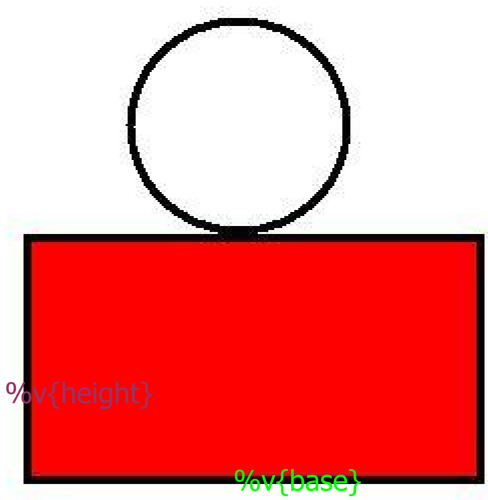
Area of circle:

The formula for calculating the area of the circle is ∏* r^2

The question provides the diameter of the circle, so we need to first convert it to the radius.
radius = diameter/2
radius =%v{diameter}/2
radius = %v{diameter/2}

Area = ∏ * (radius)^2 Let's subsititute it in the formula
Area = 3.14 * (radius)^2
Area = 3.14 * %v{diameter*diameter*0.25} Multiply
Area = %v{circle}

Area of rectangle:



The formula for calculating the of area the rectangle = base*height

The base of the rectangle is %v{base}
The height of the rectangle is %v{height}

Area = base * height Let's substitute it in the formula

Area = %v{base} * %v{height} Now multiply

Area = %v{rec}

Now we can combine the two areas together to get the area of the object

The area of the object = area of circle + area of rectangle
=%v{circle}+%v{rec}
=%v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem Drag edit delete

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #65824 "65824 - 65824- area of shade square circle"

What is the area of the shaded region in the figure below? (Use 3.14 for ∏)

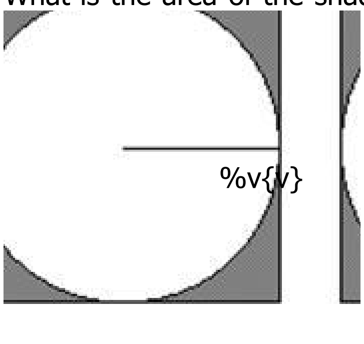


image not to scale

Algebra:

✓ %v{ans}

Scaffold:

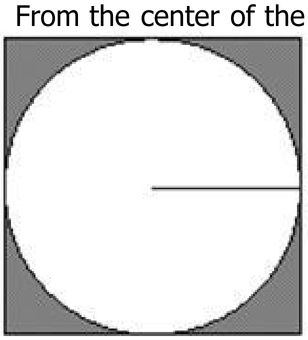
Here is a complete explanation.

To get the answer, we will subtract the area of the circle from the area of the square.

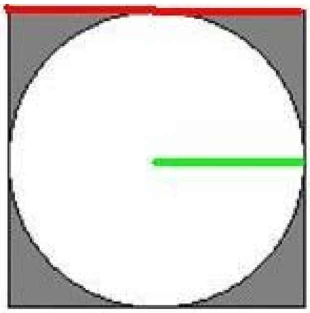
First, let's find the area of the square.

To find the area of a square, we must know the length of its sides.
What is the length of a side of the square?

- From the center of the circle to the edge, or the radius, is %v{v}.



- The length of a side of the square is twice the radius of the circle.



- The length of the side of the square is %v{v} x 2, or %v{v*2}.

- To find the area of the square, multiply the length of one side of the square by itself: $A = s^2$
  - $A = s^2$, so the area of the square equals %v{2*v}^{2}
  - %v{2*v}^{2} = %v{4*v*v}. The area of the square is %v{4*v*v} .

Now we need to find the area of the circle.

The formula for finding the area of a cirle is A = ∏ * r^2
So the area of the circle is 3.14 * %v{v}^{2} = %v{3.14*v*v}

Now we subtract the area of the circle from the area of the square:
%v{4*v*v} -%v{3.14*v*v} = %v{ans}
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #65929 "65929 - 65929 square within square"

The figure below shows a square inscribed in a larger square. What is the area of the smaller square?

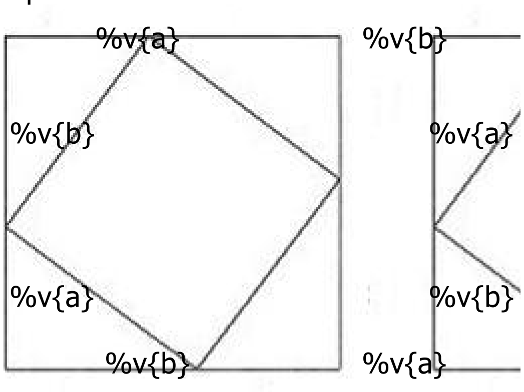


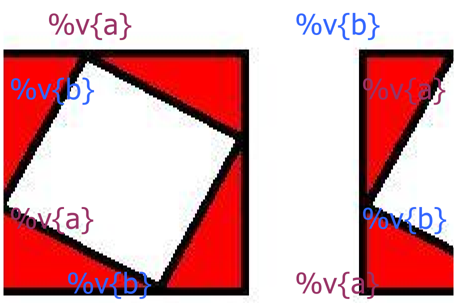
image not to scale

Algebra:

%v{ans}

Scaffold:

In order to find the area of the smaller square, we can first find the area of the larger square then subtract the area of the four triangles from it.



The formula for calculating the area of a square is Side * Side.

In our case, the side is %v{a} + %v{b} = %v{a+b}.
The area of the square is %v{a+b} * %v{a+b} = %v{(a+b)*(a+b)}

The area of the larger square is %v{(a+b)*(a+b)}

As we can see, all four triangles are right triangles.

Therefore, we can find the area of each of them by using the formula

Area = Base * Height / 2.

We also notice that all four triangles have the same area. In order to find the total area of all four triangles, we have:

Total area = area1 + area2 + area3 + area4
= (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2)
= (Base * Height / 2) * 4

Total area = Base * Height / 2 * 4
= (%v{a} * %v{b}) /2 *4
= %v{a*b/2}*4
= %v{a*b*2}

Therefore, the total area of all four triangles is %v{a*b*2}

Recall that the larger square has an area of %v{(a+b)*(a+b)} and the total area of all four triangles we identified is %v{a*b*2}.

Therefore, the area of the smaller sqaure is %v{(a+b)*(a+b)} - %v{a*b*2} = %v{ans}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #70862 "70862 - 62276 - 58787 - Area of the irregular figure"

What is the area of this object with given information?

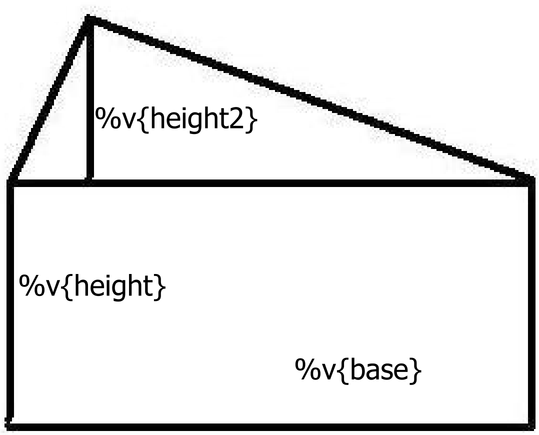


image not to scale

Algebra:

%v{answer}

Scaffold:

Here is a complete explanation

This object has two parts, the top part is a triangle and the bottom part is a rectangle. We can get the area of the object by getting the area of the two parts and add them together.

Area of triangle:

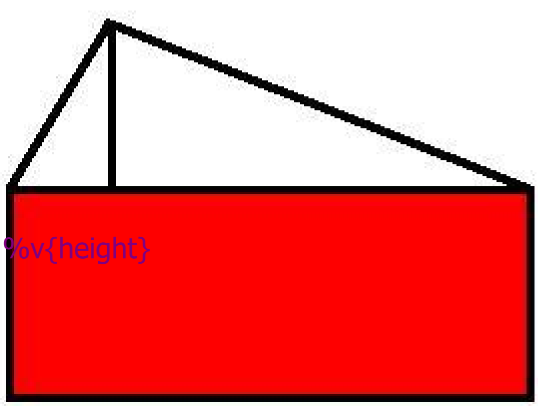
%v{base}

The formula for calculating the area of the triangle is
Area = base * height/2

The question provides the base of the rectangle, which is the same as the base of the triangle.

Area = Base * Height /2	Let's subsititute it in the formula
Area = %v{base} * %v{height2} /2	Multiply
Area = %v{base * height2}/2	
Area = %v{triangle}	

Area of rectangle:



%v{base}

The formula for calculating the of area the rectangle is
Area = base*height

The base of the rectangle is %v{base}
The height of the rectangle is
%v{height}

Area = base * height	Let's substitute it in the formula
Area = %v{base} * %v{height}	Now multiply
Area = %v{rec}	

Now we can combine the two areas together to get the area of the object

The area of the object = area of triangle + area of rectangle
=%v{triangle}+%v{rec}
=%v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem Drag edit delete

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #73659 "73659 - 62276 - 58787 - Area of the irregular figure"

What is the area of this object with given information? Use 3.14 for ∏

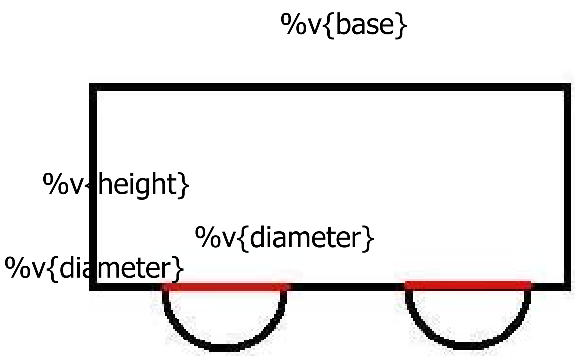


image not to scale

Algebra:

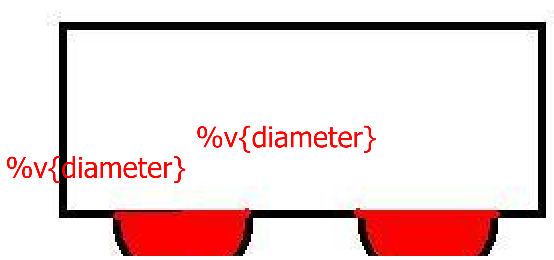
%v{answer}

Scaffold:

Here is a complete explanation

This object has two parts, the top part is a rectangle and the bottom part are two half circles. We can get the area of the object by getting the area of the two parts and add them together.

Area of half circle:



The formula for calculating the area of the circle is:

Area = ∏*radius^2

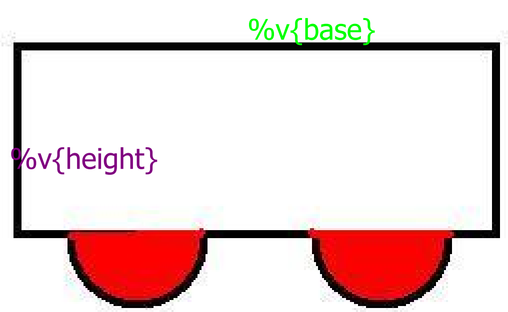
The question provides the diameter of the circle, so we need to convert it to radius first.

radius = diameter/2
radius =%v{diameter}/2
radius = %v{diameter/2}

Because we have two identical half circles, we can treat them as one full circle.

Area = ∏ * (radius)^2 Let's subsititute it in the formula
Area = 3.14 * (radius)^2
Area = 3.14 * %v{diameter*diameter*0.25} Multiply
Area = %v{2*halfcir}

Area of rectangle:



The formula for calculating the of area the rectangle is:

Area = base*height

The base of the rectangle is %v{base}
The height of the rectangle is
%v{height}

Area = base * height Let's substitute it in the formula

Area = %v{base} * %v{height} Now multiply

Area = %v{rec}

Now we can combine the two areas together to get the area of the object

The area of the object = area of two half circle + area of rectangle
=%v{2*halfcir}+%v{rec}
=%v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #73660 "73660 - 60650 - Base from area and height"

What is the base of the parallelogram with the area of %v{answer} and height of %v{height}?

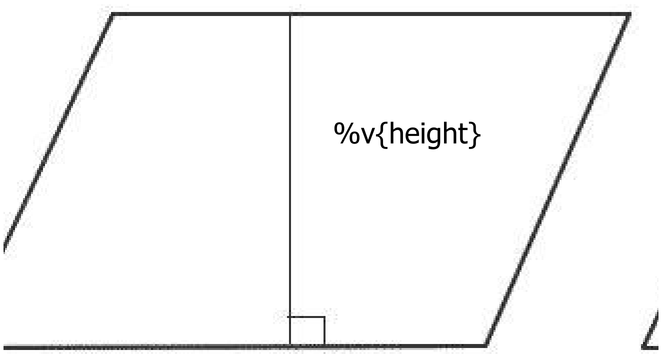


image not to scale

Algebra:

%v{base}

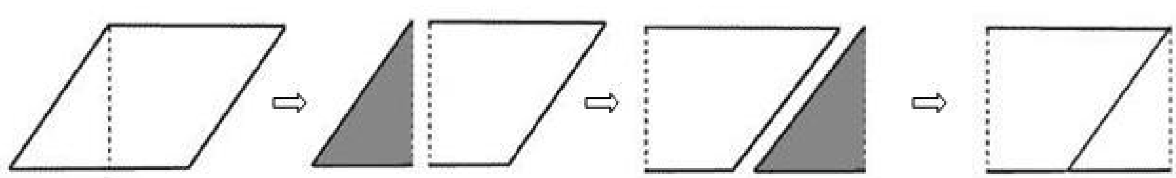
Scaffold:

Here is a complete explanation

The area of the parallelogram is the region it occupies.

The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting



The area of the parallelogram is %v{answer}
The height of the parallelogram is %v{height}

Area = base * height	Let's substitute it in the formula from last step
%v{answer}= base * %v{height}	Now divide

%v{answer} / %v{height} = base
base = %v{base}

The base of the parallelogram is %v{base}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #73661 "73661 - 60650 - Height from area and base"

What is the height of the parallelogram with the area of %v{answer} and base of %v{base}?

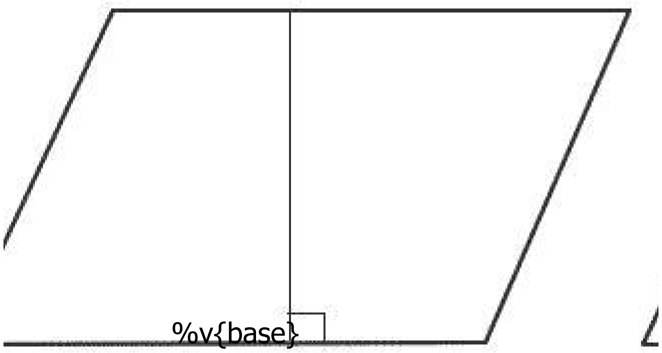


image not to scale

Algebra:

✓ %v{base}

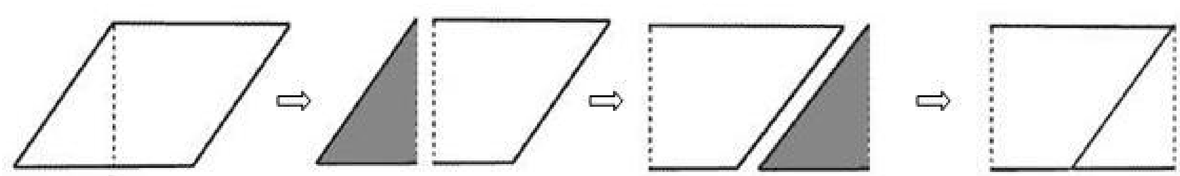
Scaffold:

Here is a complete explanation

The area of the parallelogram is the region it occupies.

The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting



The area of the parallelogram is %v{answer}
The base of the parallelogram is %v{base}

Area = base * height — Let's substitute it in the formula from last step
%v{answer} = %v{base} * height — Now divide
%v{answer} / %v{base} = height
height= %v{height}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #73662 "73662 - 60650 - Area of the Parallelogram with base and height"

What is the height of the parallelogram with the area of %v{answer} and the following information?

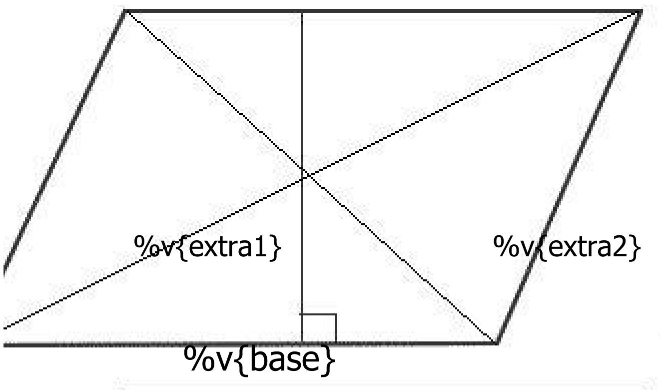


image not to scale

Algebra:

✓ %v{height}

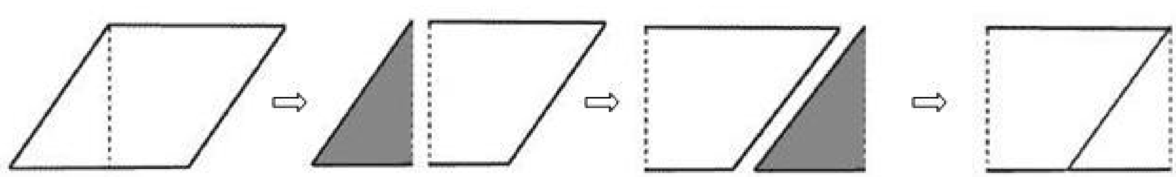
Scaffold:

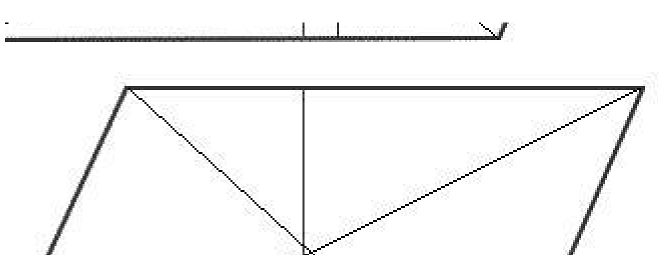
Here is a complete explanation

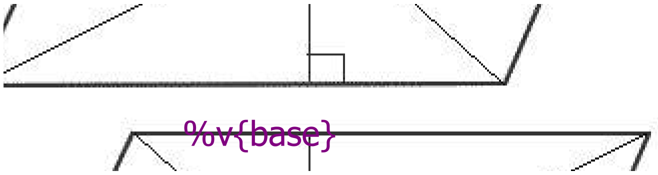
The area of the parallelogram is the region it occupies.

The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting







The area of the parallelogram is %v{answer}
The base of the parallelogram is %v{base}
No other information is needed.

Area = base * height	Let's substitute it in the formula from last step
%v{answer} = %v{base} * height	Now divide
%v{answer} / %v{base} = height	
height= %v{height}	

Multiple choice:

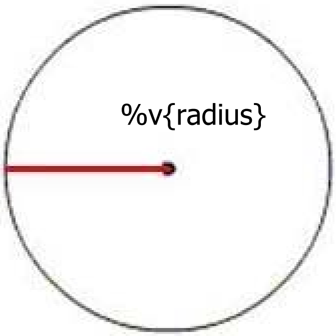
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers
If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

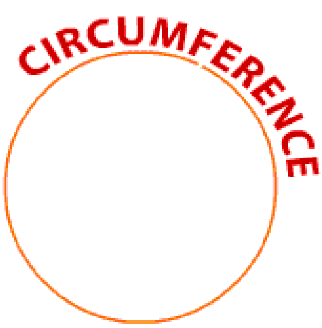
Assistment #74181 "74181 - 62271 - circumference of the circle using radius"
What is the circumference of the circle with the radius of %v{radius}? (use 3.14 for ∏)



Algebra:
✓ %v{answer}

Scaffold:
Here is a complete explanation.

The circumference of the circle is distance around the edge of the circle. Don't confuse it with the area.



The radius of the circle is %v{radius}

Circumference = 2 * ∏ * radius Let's substitute it in the formula from last step:
Circumference = 2 * 3.14 * %v{radius}
Circumference = 6.28 * %v{radius}

Circumference = %v{answer}

The circumference of the circle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

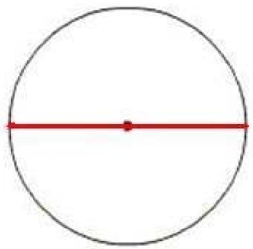
Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #74195 "74195 - 55956 - Diameter from circumference of circle"

What is the diameter of the circle when the circumference of the circle is %v{answer}? (use 3.14 for ∏)



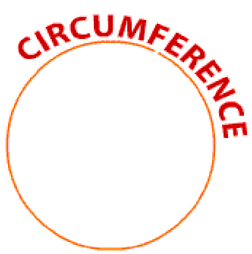
Algebra:

✓ %v{diameter}

Scaffold:

Here is a complete explanation.

The circumference of the circle is distance around the edge of the circle. Don't confuse it with the area.



We need to find the radius from the circumference of the circle

circumference = 2 * ∏ * (radius)   Let's substitute it in the formula
%v{answer} = 2 * 3.14 * (radius)
%v{answer} ÷ 3.14 = 2 * (radius)
%v{answer/3.14} = 2 * (radius)

%v{answer/3.14/2} = radius

The diameter of the circle is twice as long as the radius.

diameter = 2 x radius

= 2 x %v{radius}

= %v{diameter}

√

%

The diameter of the circle is diameter = %v{diameter}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

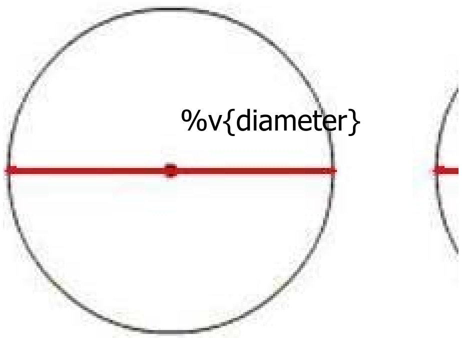
Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #74545 "74545 - 62273 - 55937 - Circumference of circle using diameter"

What is the circumference of the circle with the diameter of %v{diameter}? (use 3.14 for ∏)



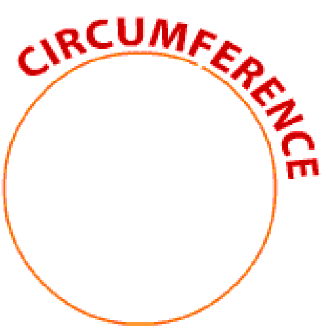
Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation

The circumference of the circle is distance around the edge of the circle. Don't confuse it with the area.



We need to find the radius in order to calculate the circumference of the circle

The radius of the circle is diameter ÷ 2 = $\frac{\%v\{diameter\}}{2}$

= %v{diameter*0.5}

Circumference = 2 * ∏ * (radius)

Substitute the values you know into the formula

Circumference = 2 * 3.14 * %v{diameter*0.5}

Circumference = 6.28 * %v{diameter*0.5}

Circumference = %v{answer}

The Circumference of the circle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

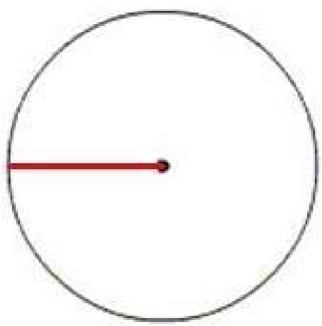
Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #74546 "74546 - Radius from circumference of circle"

What is the radius of the circle when the circumference of the circle is %v{answer}? (use 3.14 for ∏)



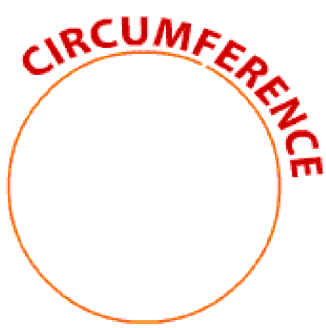
Algebra:

✓ %v{radius}

Scaffold:

Here is a complete explanation.

The circumference of the circle is distance around the edge of the circle. Don't confuse it with the area.



We need to find the radius from the circumference of the circle

Circumference = 2 * ∏ * radius Substitute the values you know into the formula
%v{answer}= 2 * 3.14 * (radius)

%v{answer}= 6.28 * (radius)
%v{answer} ÷ 6.28 = radius
%v{radius} = radius

The radius of the circle is radius = %v{radius}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75245 "75245 - 57350 - Superimposed circle areas with radius"

The outer circle has a radius of %v{radius2} and inner circle has a radius of %v{radius1}.
What is the area of the shaded region? Use 3.14 for ∏.

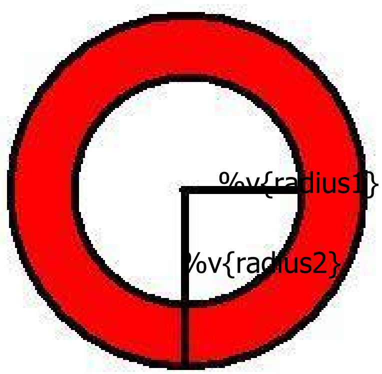


image not to scale

Algebra:

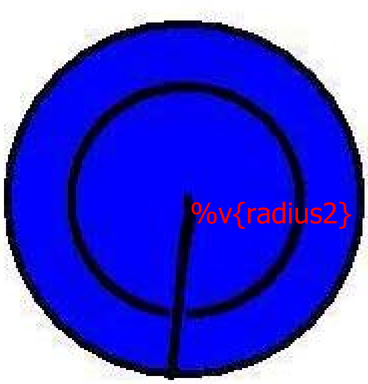
✓ %v{answer}

Scaffold:

Here is a complete explanation.

The area of the shaded region is the difference between the area of the big circle and the area of the small circle.

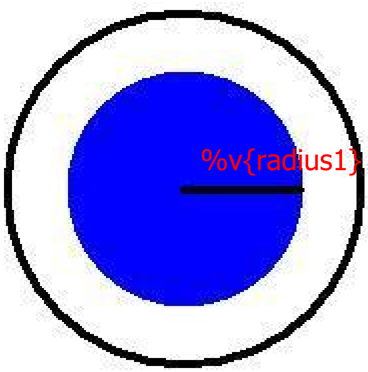
Area of big circle:



The formula for calculating the area of the circle is ∏* r^2

Area = ∏ * (radius)^2 Let's subsititute it in the formula
Area = 3.14 * %v{radius2}^2
Area = 3.14 * %v{radius2*radius2} Multiply
Area = %v{3.14*radius2*radius2}

Next, we will calculate the area of the small circle.



Just as we did for the big circle, we will get the area of the small circle in the same way.

The formula for calculating the area of the circle is ∏* r^2

Area = ∏ * (radius)^2 Let's subsititute it in the formula
Area = 3.14 * %v{radius1}^2
Area = 3.14 * %v{radius1*radius1} Multiply
Area = %v{3.14*radius1*radius1}

Because we have already gotten the area of the big circle and the area of the small circle, we can simply subtract them and get the area of the shaded region.

Shade = Area big - Area small
= %v{radius2*radius2*3.14} - %v{radius1*radius1*3.14}
= %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.

Show main problems, answers, and all tutoring.

Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75483 "75483 - 60650 - base from area and height"

What is the base of the parallelogram with the area of %v{answer} and the following information?

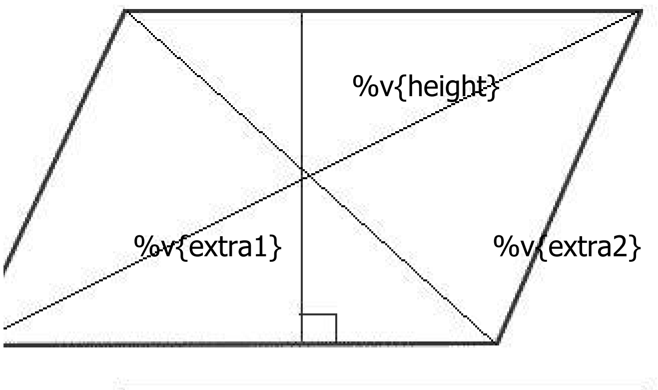


image not to scale

Algebra:

✓ %v{base}

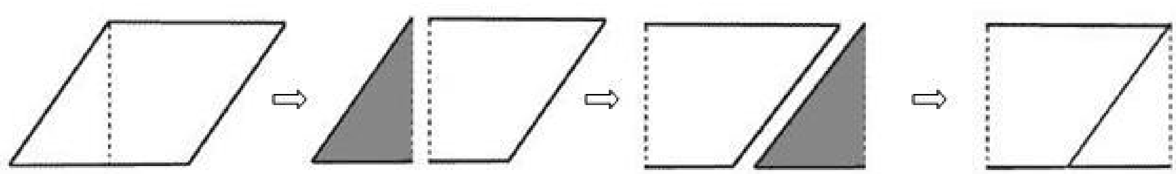
Scaffold:

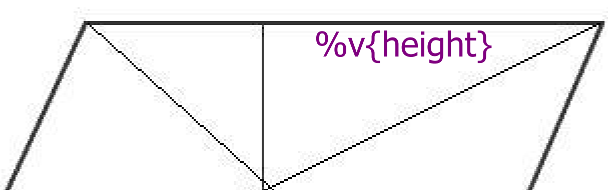
Here is a complete explanation

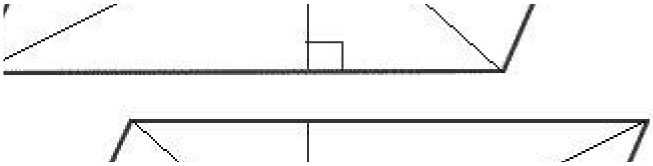
The area of the parallelogram is the region it occupies.

The formula to compute the area = base x height

You might notice that this is the same formula for calculating the area of the rectangle. In fact, a parallelogram can be transformed to a rectangle with some cutting and pasting







The area of the parallelogram is %v{answer}
The height of the parallelogram is %v{height}
No other information is needed.

Area = base * height	Let's substitute it in the formula from last step
%v{answer} = base * %v{height}	Now divide
%v{answer} / %v{height} = base	
base = %v{base}	

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75488 "75488 - Height from Area of Trapezoid"

What is the height of the trapezoid with area of %v{(a+b)*h/2} and the given information?

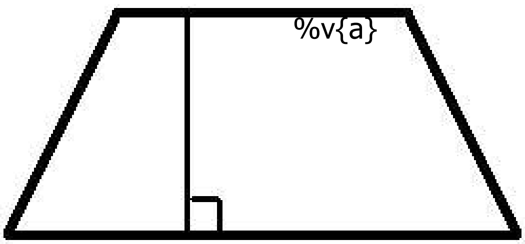


image not to scale

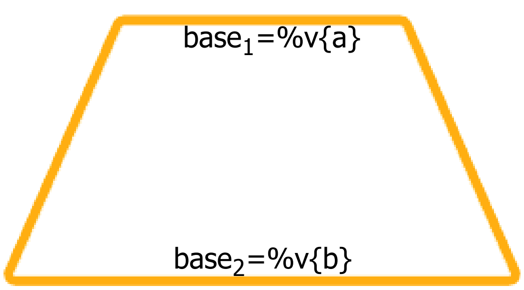
Algebra:

✓ %v{h}

Scaffold:

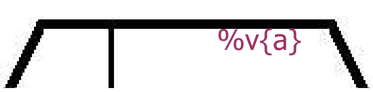
Here is a complete explanation.

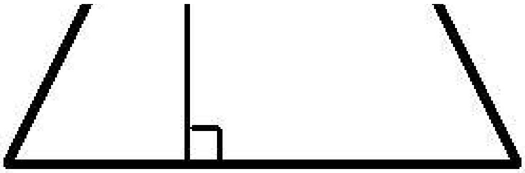
The area of the trapezoid is the region it occupies.



The area of the trapezoid is calculated by the following formula:

Area of Trapezoid $= \frac{1}{2} * (base_1 + base_2) * height$





The base1 of the trapezoid is %v{a}
The base2 of the trapezoid is %v{b}
The area of the trapezoid is %v{(a+b)*h/2}

Area of trapzoid	=	$\frac{1}{2}$ * (base$_1$ + base$_2$) * height
%v{(a+b)*h/2}	=	$\frac{1}{2}$ * (%v{a} + %v{b}) * height
%v{(a+b)*h/2}	=	$\frac{1}{2}$ * %v{a+b} * height
%v{(a+b)*h/2} / %v{(a+b)*0.5}	=	%v{(a+b)*0.5} * height / %v{(a+b)*0.5}
%v{h}	=	height

The height of the trapzoid is %v{h}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75489 "75489 - 58264 - perimeter of the triangle with base and height"

What is the perimeter of the triangle with the following information?

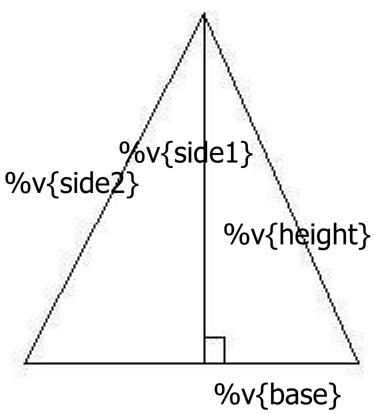


image not to scale

Algebra:

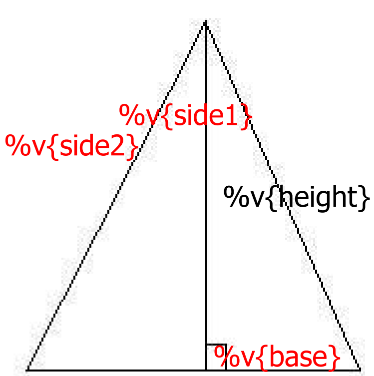
%v{answer}

Scaffold:

Here is a complete explanation.

The perimeter of the triangle is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the triangle, we would simply add all of its outer edges together.



The three sides are %v{side1}, %v{side2}, %v{base}
Note that we do not add the height of the triangle.

Perimeter= %v{side1} + %v{side2} + %v{base}
Perimeter= %v{side1+side2} + %v{base}
Perimeter = %v{answer}

The perimeter of the triangle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75679 "75679 - 75489 - 58264 - perimeter of the parallelogram"

What is the perimeter of the parallelogram the given information?

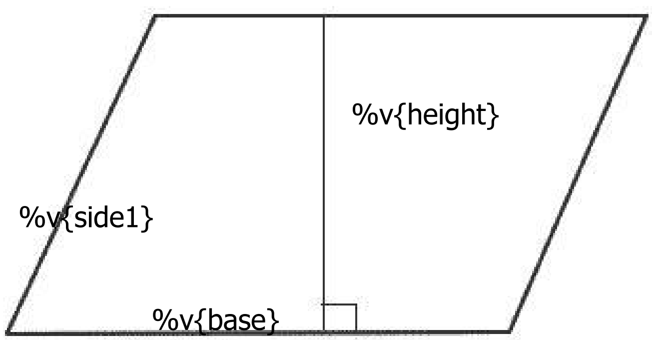


image not to scale

Algebra:

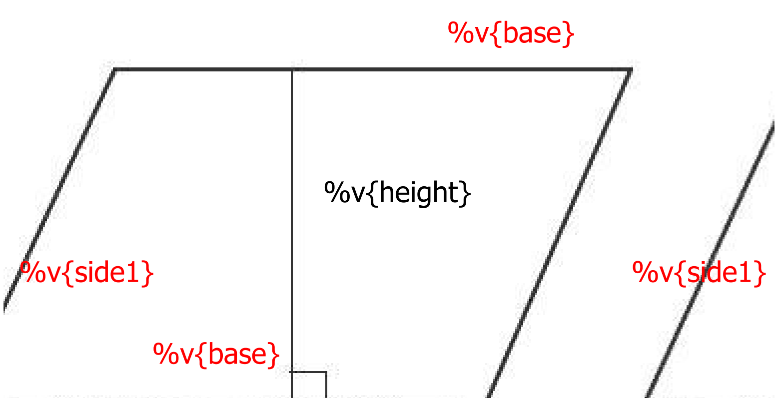
✓ %v{answer}

Scaffold:

Here is a complete explanation.

The perimeter of the parrallelogram is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the parrallelogram , we would simply add all of its outer edges together.



Because the opposite sides of a parallelogram have the same length,
The four sides are %v{side1}, %v{side1}, %v{base}, %v{base}
Note that we do not add the height of the parallelogram.

Perimeter= %v{side1} + %v{side1} + %v{base} + %v{base}
Perimeter= %v{side1+side1} + %v{base+base}
Perimeter = %v{answer}

The perimeter of the parallelogram is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75681 "75681 - 75679 - 75489 - 58264 - perimeter of the rectangle"

What is the perimeter of the rectangle with base of %v{base} and height of %v{height}?

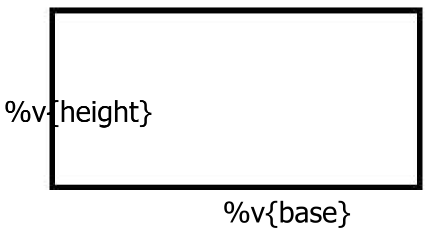


image not to scale

Algebra:

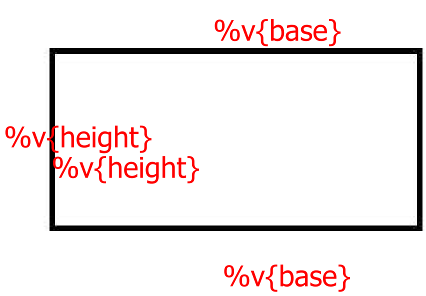
✓ %v{answer}

Scaffold:

Here is a complete explanation.

The perimeter of the rectangle is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the rectangle, we would simply add all of its outer edges together.



Because the opposite sides of a rectangle have the same length,
The four sides are %v{height}, %v{height}, %v{base}, %v{base}

Perimeter= %v{height} + %v{height} + %v{base} + %v{base}
Perimeter= %v{height+height} + %v{base+base}

Perimeter = %v{answer}

The perimeter of the rectangle is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.

Show main problems, answers, and all tutoring.

Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75742 "75742 - 75681 - 75679 - 75489 - 58264 - perimeter of the trapzoid"

What is the perimeter of the trapzoid with the given information?

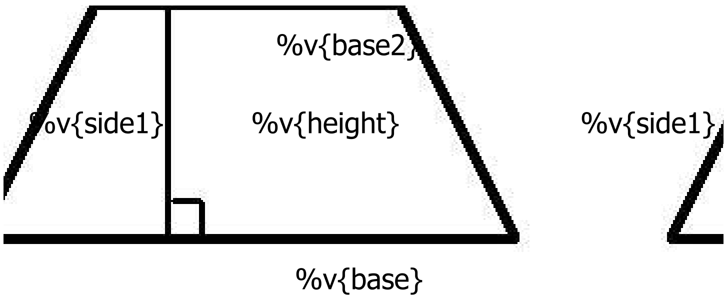


image not to scale

Algebra:

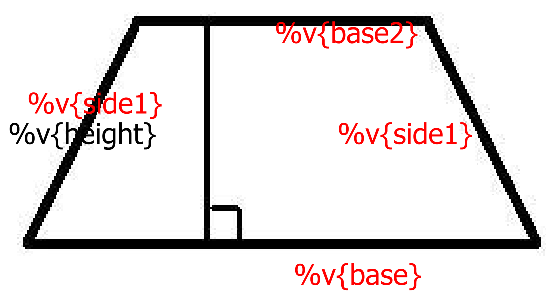
✓ %v{answer}

Scaffold:

Here is a complete explanation.

The perimeter of the trapzoid is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the trapzoid, we would simply add all of its outer edges together.



The four sides are %v{side1}, %v{base}, %v{side1}, %v{base2}

The height is not used for calculation.

Perimeter= %v{side1} + %v{base} + %v{side1} + %v{base2}

Perimeter= %v{side1+base} + %v{side1+base2}

Perimeter = %v{answer}

The perimeter of the trapzoid is %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #75986 "75986 - 75681 - 75679 - 75489 - 58264 - perimeter of the square"

What is the perimeter of the square with the given information?

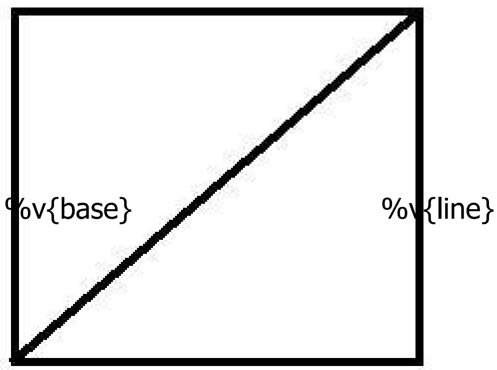


image not to scale

Algebra:

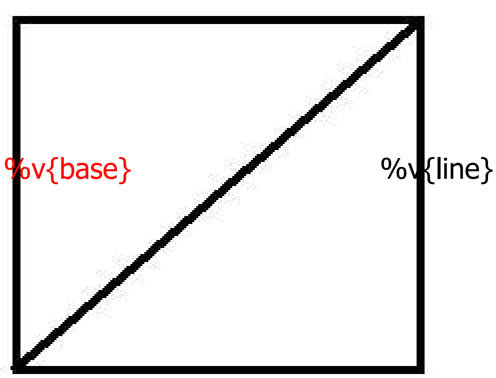
✓ %v{answer}

Scaffold:

Here is a complete explanation.

The perimeter of the square is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the square, we would simply add all of its outer edges together.



Because all four sides of the square have the same length,
The four sides are %v{base}, %v{base}, %v{base}, %v{base}
Note that only the outer edges are used.

Perimeter= %v{base} + %v{base} + %v{base} + %v{base}
Perimeter= %v{base+base} +%v{base+base}
Perimeter = %v{answer}

The perimeter of the square is %v{answer}
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #76089 "76089 - 75986 - 75681 - 75679 - 75489 - 58264 - perimeter of the square"

What is the perimeter of the follwing object with the given information?

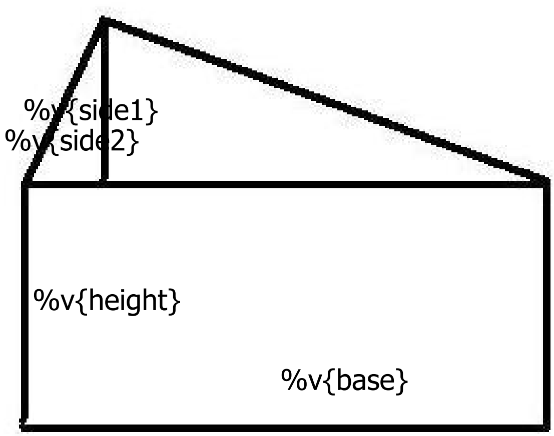


image not to scale

Algebra:

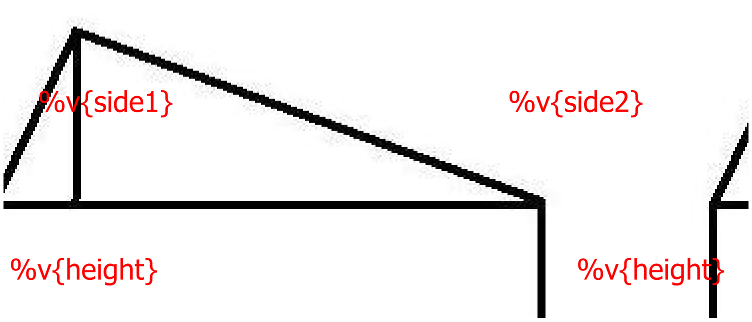
%v{answer}

Scaffold:

Here is a complete explanation.

The perimeter of the object is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the object, we would simply add all of its outer edges together.



Because the opposite sides of a rectangle have the same length,
The five sides are %v{height}, %v{base}, %v{height}, %v{side2}, %v{side1}

Perimeter= %v{height} + %v{base} + %v{height} + %v{side2} +%v{side1}
Perimeter= %v{height+base} + %v{height+side2} + %v{side1}
Perimeter = %v{height+base+height+side2} + %v{side1}
Perimeter = %v{answer}

The perimeter of the object is %v{answer}
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Show main problems.
Show main problems, answers, and all tutoring.
Show main problems and your choice of tutoring.

☐ Condense Answers

If you want to save this problem set to your computer you can press Control and P at the same time to bring up the print dialog select then select the option to print to PDF.

Change Format

Assistment #76090 "76090 - 75986 - 75681 - 75679 - 75489 - 58264 - perimeter of the polygon"

What is the perimeter of the follwing regular polygon with 5 sides?

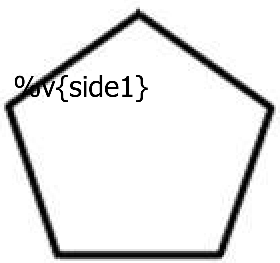


image not to scale

Algebra:

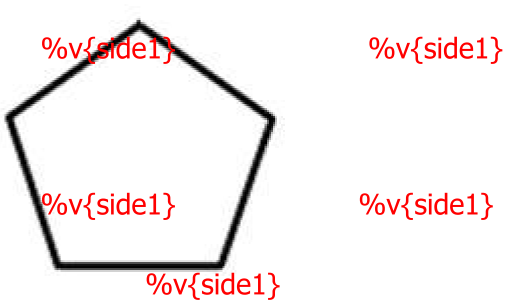
✓ %v{answer}

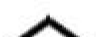
Scaffold:

Here is a complete explanation.

The perimeter of the regular polygon is the sum of it's edges. Don't confuse it with the area.

To get the perimeter of the polygon, we would simply add all of its outer edges together.





Because the regular polygon have the same length for all of its sides,
The five sides are %v{side1}, %v{side1}, %v{side1}, %v{side1}, %v{side1}

Perimeter= %v{side1} + %v{side1} + %v{side1} + %v{side1} +%v{side1}
Perimeter= %v{side1+side1} + %v{side1+side1} + %v{side1}
Perimeter = %v{4*side1} + %v{side1}
Perimeter = %v{answer}

The perimeter of the regular polygon is %v{answer}
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem

Appendix E: Volume ASSISTments

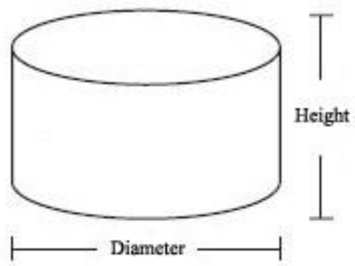
Original Content Created by Steven Southard

VOLUME OF A CYLINDER

TEMPLATE #60196

WITH VARIABLES

Diameter = %v{diameter} in.
Height = %v{height} in.



picture not to scale

What is the Volume of the cylinder (in^3)?
If there is not enough information to solve, type 0.
Use 3.14 for ∏

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation:
Volume = Area of Base x Height
Volume = (Pi x Radius^2) x Height

We can find the Radius from the Diameter: **Diameter = 2 x Radius**

Radius = $\frac{\text{Diameter}}{2}$ **Solve for Radius**

Radius = $\frac{\text{\%v\{diameter\}}}{2}$ = %v{radius} **Plug in Diameter and Simplify**

Now use the Radius in the Volume formula:
Volume = (Pi x %v{radius}^{2}) x %v{height} Substitute values (remember

radius is half the diameter.)

Volume = %v{answer_raw}

Obtain the volume in in^3

The answer is %v{answer} in^3

Multiple choice:

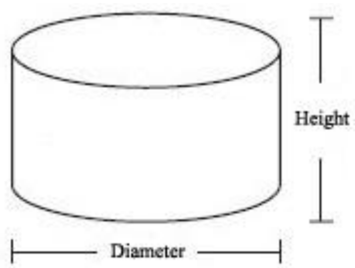
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 89324

For this template, both the tutoring with "complete explanation" and "hints" will be shown. Although both types of problems were made for each skill, only "complete explanation" tutoring will be shown after this example due to the fact that the content of the tutoring is the same for both "complete explanation" and "hints".

COMPLETE EXPLANATION

Diameter = 6 in.
Height = 1 in.



picture not to scale

What is the Volume of the cylinder (in^3)?
If there is not enough information to solve, type 0.
Use 3.14 for ∏

Algebra:

✓ 28.26

Scaffold:

Here is a complete explanation:
Volume = Area of Base x Height
Volume = (Pi x $Radius^2$) x Height

We can find the Radius from the Diameter: Diameter = 2 x Radius

$$\text{Radius} = \frac{\text{Diameter}}{2}$$ **Solve for Radius**

$$\text{Radius} = \frac{6}{2} = 3$$ **Plug in Diameter and Simplify**

Now use the Radius in the Volume formula:

Volume = (Pi x 3^2) x 1 Substitute values (remember radius is half the diameter.)

Volume = 28.26 Obtain the volume in in^3

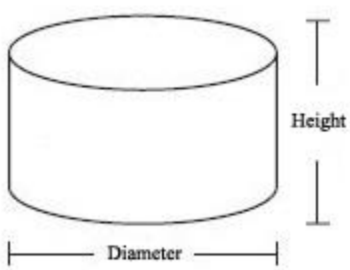
The answer is 28.26 in^3

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

HINTS

Diameter = 6 in.
Height = 4 in.



picture not to scale

What is the Volume of the cylinder (in^3)?
If there is not enough information to solve, type 0.
Use 3.14 for ∏

Algebra:

✓ 113.04

Hint 1:

Volume = Area of Base x Height

Hint 2:

Volume = Area of Base x Height
Volume = (∏ x Radius^2) x Height

Hint 3:
Volume = Area of Base x Height
Volume = (Pi x Radius^2) x Height

Volume = (Pi x 3^2) x 4 Substitute values remember radius is half the diameter.

Hint 4:

Volume = 113.04 Obtain the volume in in^3

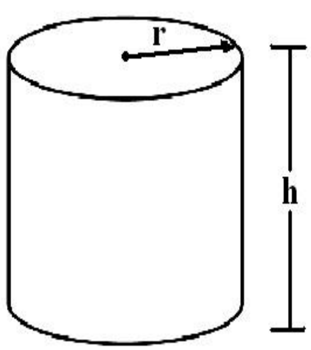
The answer is 113.04 in^3

Type 113.04

TEMPLATE #60200

WITH VARIABLES

Radius = %v{radius} in.
Height = %v{height} in.



picture not to scale

What is the Volume of the cylinder (in^3)?
If there is not enough information to solve type 0
Use 3.14 for ∏

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete Explanation:

Volume = Area of Base x Height
Volume = (∏ x Radius^2) x Height
Volume = (3.14 x %v{radius}^{2}) x %v{height} plug in values for radius and height
Volume = %v{answer_raw}

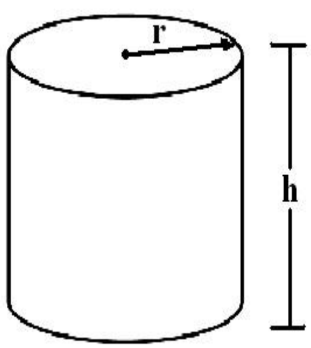
The answer is %v{answer} in^2

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 89829

Radius = 1 in.
Height = 4 in.



picture not to scale

What is the Volume of the cylinder (in^3)?
If there is not enough information to solve type 0
Use 3.14 for ∏

Algebra:

✓ 12.56

Scaffold:

Here is a complete Explanation:

Volume = Area of Base x Height
Volume = (∏ x Radius^2) x Height
Volume = (3.14 x 1^2) x 4 plug in values for radius and height
Volume = 12.56

The answer is 12.56 in^2

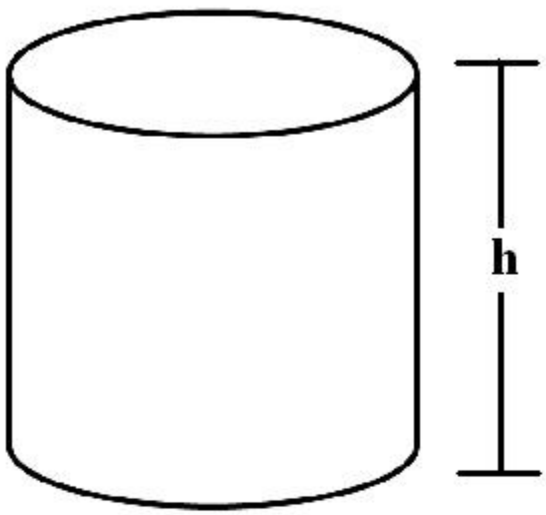
Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60197

WITH VARIABLES

Volume = %v{vol} in^3
Height = %v{hgt} in



picture not to scale

What is the Radius of the cylinder (inches)? (If there is not enough information to solve type 0)
Use 3.14 for ∏ and round to the nearest hundredth.

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation:

$V_{cylinder}$ = Area of Base * Height
V = Area of Base * Height
V = ∏ x r^2 x h Since the base is a circle the area formula is

Pi x r^2

$\%v\{vol\} = \underline{3.14} \text{ x } r^2 \text{ x } \underline{\%v\{hgt\}}$ plug in numbers

$\%v\{vol\} = \underline{\%v\{hgt*3.14\}} \text{ x } r^2$ combine terms

$\%v\{vol\} / \%v\{hgt*3.14\} = r^2$ isolate r

$\sqrt{}(\%v\{vol\} / \%v\{hgt*3.14\}) = r$ take the square root of both sides

$(r = \sqrt{r^2})$

%v{rad} = r Now round to the nearest hundredth

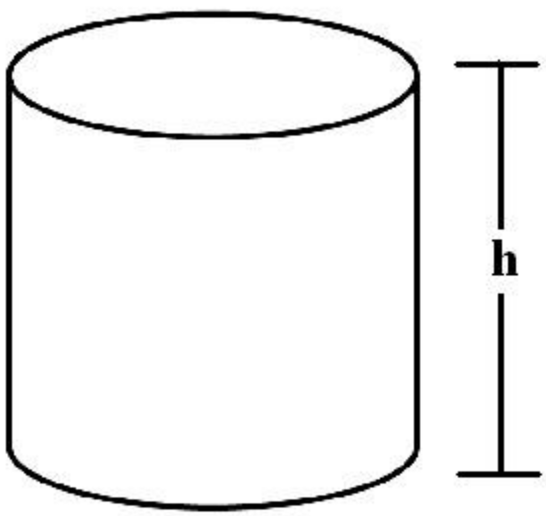
The radius is %v{answer} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 60895

Volume = 161 in^3
Height = 5 in



picture not to scale

What is the Radius of the cylinder (inches)? (If there is not enough information to solve type 0)
Use 3.14 for ∏ and round to the nearest hundredth.

Algebra:

✓ 3.2

Scaffold:

Here is a complete explanation:

$V_{cylinder}$ = Area of Base * Height

V = Area of Base * Height

V = ∏ x r^2 x h Since the base is a circle the area formula is Pi x r^2

161 = 3.14 x r^2 x 5 plug in numbers

161 = 15.7 x r^2 combine terms

161 / 15.7 = r^2 isolate r

√(161 / 15.7) = r take the square root of both sides (r = √r^2)

3.20230808481378 = r Now round to the nearest hundredth

The radius is 3.2 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60198

WITH VARIABLES

A cylindrical %v{var} storage tank is %v{hgt} feet high and has a radius of %v{rad} feet. What is the maximum volume of %v{var} that can be stored in the tank?

Use 3.14 for ∏

Algebra:

✓ %v{ans}

Scaffold:

Here is a complete explanation:

Draw a picture of the %v{var} storage tank and label the heigh and radius. (remember it is a cylider)

%v{var} Storage Tank

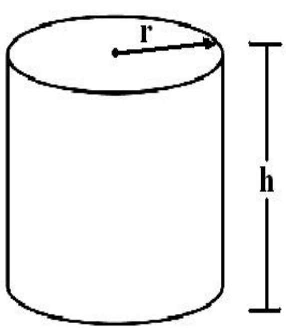


image not to scale

radius = %v{rad}
height = %v{hgt}

V = Area of Base x Height
V = ∏ x r^2 x h The area of the base is a circle
V = 3.14 x %v{rad}^{2} x %v{hgt} Substitute values for r and h

V = %v{ans}

The volume of the %v{var} storage tank is %v{ans} cubic feet.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #60915

A cylindrical Water storage tank is 1 feet high and has a radius of 1 feet. What is the maximum volume of Water that can be stored in the tank?

Use 3.14 for ∏

Algebra:

✓ 3.14

Scaffold:

Here is a complete explanation:

Draw a picture of the Water storage tank and label the heigh and radius. (remember it is a cylinder)

Water Storage Tank

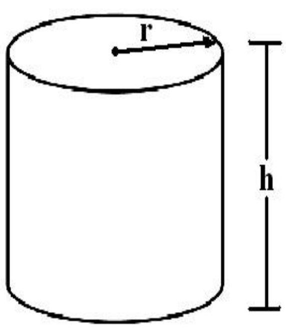


image not to scale

radius = 1
height = 1

V = Area of Base x Height
$V = \prod \times r^2 \times h$ The area of the base is a circle
$V = 3.14 \times 1^2 \times 1$ Substitute values for r and h

V = 3.14

The volume of the Water storage tank is 3.14 cubic feet.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #60199

WITH VARIABLES

A cylindrical %v{var} storage tank needs to be built to hold %v{vol} cubic feet of %v{var}. The foundation for the tank has already been poured out of 6 foot thick concrete. The radius of the tank will be %v{rad} feet. What is the minimum height that the tank can be (in feet)?

Use 3.14 for ∏ and round to the nearest whole number.

Algebra:

✓ %v{ans}

Scaffold:

Here is a complete explanation:

Draw a picture of the %v{var} storage tank and label the heigh and radius. (remember it is a cylider)

%v{var} Storage Tank

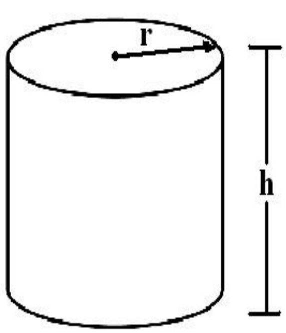


image not to scale

radius = %v{rad}

Volume= %v{vol}

V = Area of Base x Height
V = ∏ x r^2 x h — The area of the base is a circle
%v{vol} = 3.14 x %v{rad}^{2} x h — Substitute values for r and h
h = %v{vol}/(3.14 x %v{rad}^{2}) — Divide both sides by (3.14 x %v{rad}^{2})
h = %v{ans}

The tank would need to be at least %v{ans} feet tall

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #60935

A cylindrical Water storage tank needs to be built to hold 50.24 cubic feet of Water. The foundation for the tank has already been poured out of 6 foot thick concrete. The radius of the tank will be 4 feet. What is the minimum height that the tank can be (in feet)?

Use 3.14 for ∏ and round to the nearest whole number.

Algebra:

✓ 1

Scaffold:

Here is a complete explanation:

Draw a picture of the Water storage tank and label the heigh and radius. (remember it is a cylider)

Water Storage Tank

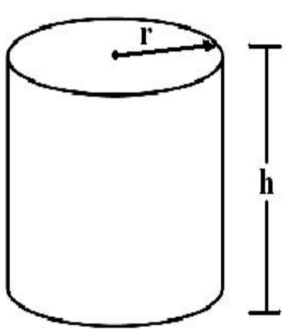


image not to scale

radius = 4
Volume= 50.24

V = Area of Base x Height
$V = \prod \times r^2 \times h$ The area of the base is a circle
$50.24 = 3.14 \times 4^2 \times h$ Substitute values for r and h
$h = 50.24/(3.14 \times 4^2)$ Divide both sides by (3.14×4^2)
$h = 1$

The tank would need to be at least 1 feet tall

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #60201

WITH VARIABLES

Volume = %v{vol} in^3
Radius= %v{rad} in

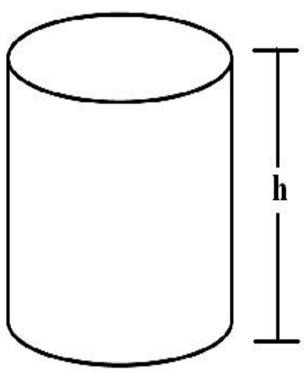


image not to scale.

What is the Height of the cylinder (inches)?
If there is not enough information to solve, type 0.
Use 3.14 for ∏ and round to the nearest tenth.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a complete explanation:

V = Area of Base * Height
$V = Pi \times r^2 \times h$ Since the base is a circle the area formula is Pi x r^2
V = Area of Base * Height

$V = Pi \times r^2 \times h$

%v{vol} = 3.14 x %v{rad}^{2} x h substitute values from problem statement

%v{vol} = %v{3.14*rad2} x h 3.14 x %v{rad}^{2} = %v{rad2 * 3.14}

%v{vol} / (3.14 x %v{rad}^{2}) = h divide both sides by %v{3.14*rad2}

%v{hgt} = h next, round this value to the tenths place

The height is %v{answer} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 60955

Volume = 481 in^3
Radius= 4 in

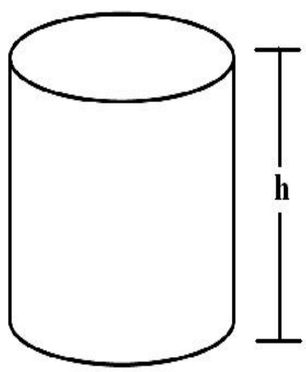


image not to scale.

What is the Height of the cylinder (inches)?
If there is not enough information to solve, type 0.
Use 3.14 for ∏ and round to the nearest tenth.

Algebra:

✓ 9.6

✗ 0

Scaffold:

Here is a complete explanation:

V = Area of Base * Height

$V = Pi \times r^2 \times h$ Since the base is a circle the area formula is Pi x r^2

V = Area of Base * Height

$V = Pi \times r^2 \times h$

$481 = 3.14 \times 4^2 \times h$ substitute values from problem statement

$481 = 50.24 \times h$ $3.14 \times 4^2 = 50.24$

$481 / (3.14 \times 4^2) = h$ divide both sides by 50.24

$9.57404458598726 = h$ next, round this value to the tenths place

The height is 9.6 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #60202

WITH VARIABLES

Base Area = %v{ba} in.^{2}
Height = %v{hgt} in.

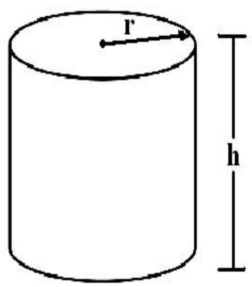


image not to scale

What is the Volume of the cylinder (in^3)?
if there is not enough information type 0.
Use 3.14 for ∏.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a complete explanation:

V = Area of Base x Height
V = %v{ba} x %v{hgt}
V = %v{answer}

The answer is %v{answer} in^3

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #60975

Base Area = 79 $in.^2$
Height = 9 in.

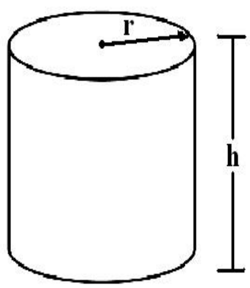


image not to scale

What is the Volume of the cylinder (in^3)?
if there is not enough information type 0.
Use 3.14 for ∏.

Algebra:

✓ 711

✗ 0

Scaffold:

Here is a complete explanation:

V = Area of Base x Height
V = 79 x 9
V = 711

The answer is 711 in^3

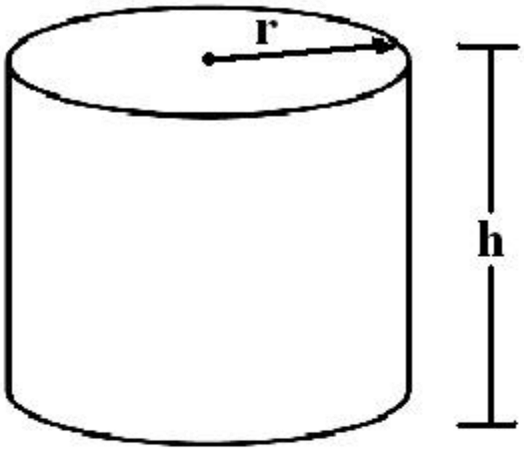
Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #60203

WITH VARIABLES

Radius = %v{radius} in.
Base Area = %v{ba} in.^{2}



What is the Volume of the cylinder (square inches)?
If there is not enough information to solve, type 0
Use 3.14 for ∏ and round to the nearest whole number.

Algebra:

✓ %v{answer}

✗ %v{ans_wrong}

Scaffold:

Here is a complete explanation:

Volume = Area of Base x Height
- We know the area of the base
- We **do not know** the **height** and **can not determine it** from any of the given information.

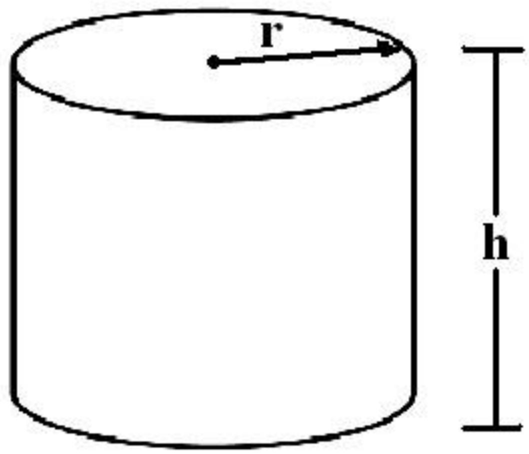
This problem cannot be solved

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #60995

Radius = 4 in.
Base Area = 50 in.^{2}



What is the Volume of the cylinder (square inches)?
If there is not enough information to solve, type 0
Use 3.14 for ∏ and round to the nearest whole number.

Algebra:

✓ 0

✗ 200

Scaffold:

Here is a complete explanation:

Volume = Area of Base x Height
- We know the area of the base
- We **do not know** the **height** and **can not determine it** from any of the given information.

This problem cannot be solved

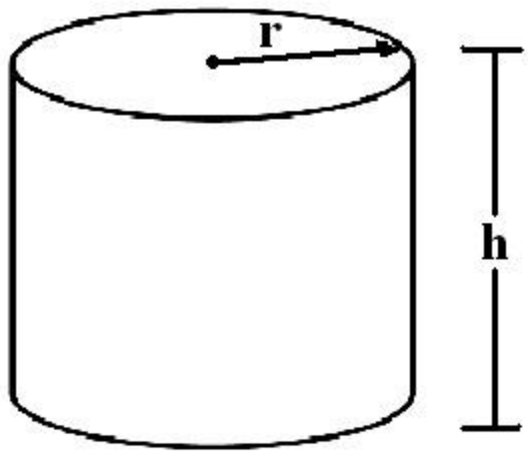
Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #60204

WITH VARIABLES

Radius = %v{radius} in.
Diameter = %v{(2*radius)}in
Base Area = %v{ba} in.^{2}



What is the Volume of the cylinder (cubic inches)?
If there is not enough information to solve, type 0
Use 3.14 for ∏ and round to the nearest whole number.

Algebra:

✓ %v{answer}

✗ %v{ans_wrong}

Scaffold:

Here is a complete explanation:

Volume = Area of Base x Height
- We know the area of the base
- We **do not know** the **height** and **can not determine it** from any of the given information.

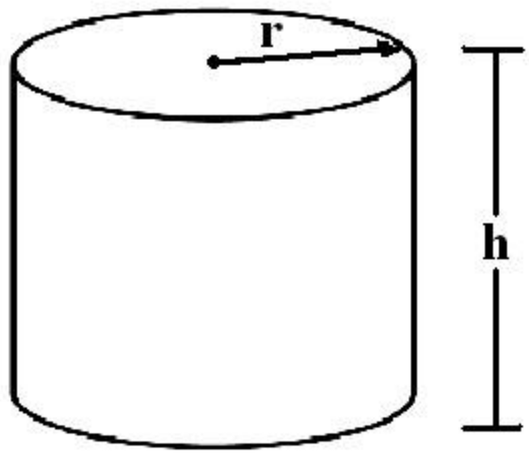
This problem cannot be solved so you would type in "0"

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #61015

Radius = 4 in.
Diameter = 8in
Base Area = 50 in.^{2}



What is the Volume of the cylinder (cubic inches)?
If there is not enough information to solve, type 0
Use 3.14 for ∏ and round to the nearest whole number.

Algebra:

✓ 0

✗ 200

Scaffold:

Here is a complete explanation:

Volume = Area of Base x Height
- We know the area of the base
- We **do not know** the **height** and **can not determine it** from any of the given information.

This problem cannot be solved so you would type in "0"

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

VOLUME OF PYRAMIDS

TEMPLATE #62905

WITH VARIABLES

Height = %v{height} inches
Base Area = %v{abase} square inches

What is the volume of the rectangular pyramid shown below? (cubic inches)

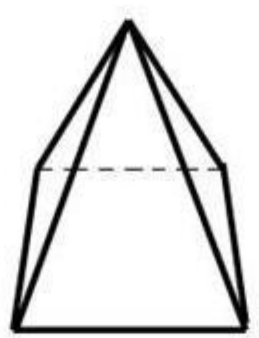


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a complete explanation:

$$V = \frac{1}{3} \times \text{Area of Base} \times \text{Height}$$

$$V = \frac{1}{3} \times \%v\{abase\} \times \%v\{height\}$$ **Substitute given values**

$V = \frac{1}{3}$ x %v{abase} x %v{height} **Substitute given values**

V = %v{volume} **Multiply Terms**

V = %v{answer} **Rounded to the nearest hundredth**

The Volume of the Rectangular Pyramid is %v{answer} cubic inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90513

Height = 7 inches
Base Area = 6 square inches

What is the volume of the rectangular pyramid shown below? (cubic inches)

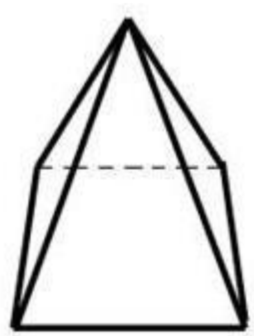


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 14
✗ 0

Scaffold:

Here is a complete explanation:

$V = \frac{1}{3}$ x Area of Base x Height

$V = \frac{1}{3} \times 6 \times 7$ **Substitute given values**

$V = \frac{1}{3} \times 6 \times 7$ **Substitute given values**

$V = 14$ **Multiply Terms**

$V = 14$ **Rounded to the nearest hundredth**

The Volume of the Rectangular Pyramid is 14 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 62906

WITH VARIABLES

Height = %v{height} inches

Length = %v{length} inches
Width = %v{width} inches

What is the volume of the rectangular pyramid shown below? (cubic inches)

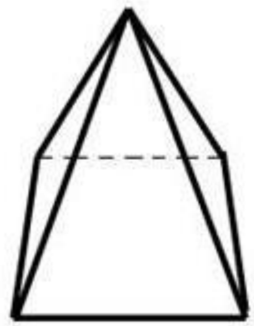


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a Complete Explanation:

$$V = \frac{1}{3} \times \text{Area of Base} \times \text{Height}$$

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

A = %v{length} * %v{width} **Substitute given values**

A = %v{abase} **Multiply Terms**

Remember, from the last step Base Area = %v{abase}.

$V = \frac{1}{3}$ x %v{abase} x %v{height} **Substitute given values**

$V = \frac{1}{3}$ x %v{abase} x %v{height} **Substitute given values**

V = %v{volume} **Multiply Terms**

V = %v{answer} **Rounded to the nearest hundredth**

The Volume of the Rectangular Pyramid is %v{answer} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #90523

Height = 10 inches
Length = 10 inches
Width = 3 inches

What is the volume of the rectangular pyramid shown below? (cubic inches)

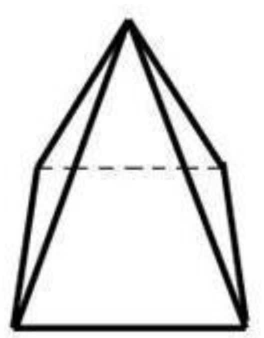


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 100

✗ 0

Scaffold:

Here is a Complete Explanation:

$$V = \frac{1}{3} \times \text{Area of Base} \times \text{Height}$$

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

$A = 10 * 3$ **Substitute given values**

$A = 30$ **Multiply Terms**

Remember, from the last step Base Area = 30.

V = 1 x 30 x 10 **Substitute given values**

$\overline{\quad}$
3

$$V = \frac{1}{3} \times 30 \times 10$$ **Substitute given values**

$V = 100$ **Multiply Terms**

$V = 100$ **Rounded to the nearest hundredth**

The Volume of the Rectangular Pyramid is 100 cubic inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 62908

WITH VARIABLES

A Pyrimid shaped tank is being constructed that will will be used for the storage of %v{storage}. The base of the tank is a rectangle with dimentsions %v{length} feet by %v{width} feet and the tank is %v{height} feet high. How much %v{storage} can the tank hold (in cubic inches)?

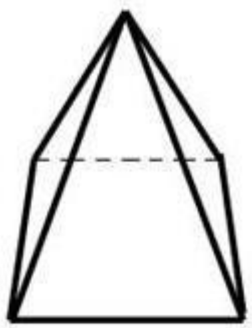
Use 3.14 for Π and round to the nearest hundredth.

Algebra:
✓ %v{answer}
✗ 0

Scaffold:

Here is a Complete Explanation:

First, draw a picture:



$V = \frac{1}{3}$ x Area of Base x Height

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

A = %v{length} * %v{width} **Substitute given values**

A = %v{abase} **Multiply Terms**

$V = \frac{1}{3}$ x %v{abase} x %v{height} **Substitute given values**

$V = \frac{1}{3}$ x %v{abase} x %v{height} **Substitute given values**

V =%v{volume} **Multiply Terms**

V = %v{answer} **Round to the nearest hundredth**

The Volume of %v{storage} that the tank can hold is %v{answer} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #90543

A Pyrimid shaped tank is being constructed that will will be used for the storage of Water. The base of the tank is a rectangle with dimentsions 9 feet by 7 feet and the tank is 5 feet high. How much Water can the tank hold (in cubic inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

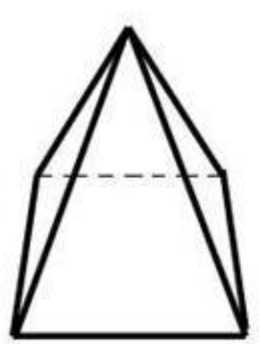
✓ 105

✗ 0

Scaffold:

Here is a Complete Explanation:

First, draw a picture:



$$V = \frac{1}{3} \text{ x Area of Base x Height}$$

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

$A = 9 * 7$ **Substitute given values**

$A = 63$ **Multiply Terms**

$V = \frac{1}{3} \times 63 \times 5$ **Substitute given values**

$V = \frac{1}{3} \times 63 \times 5$ **Substitute given values**

$V = 105$ **Multiply Terms**

$V = 105$ **Round to the nearest hundredth**

The Volume of Water that the tank can hold is 105 cubic inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #62909

WITH VARIABLES

Base Area= %v{abase} square inches
Length = %v{length} inches
Width = %v{width} inches

What is the volume of the rectangular pyramid shown below? (cubic inches)

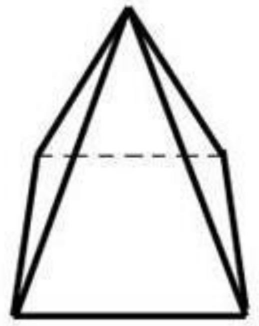


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 0

Scaffold:

Here is a Complete Explanation:

$$V = \frac{1}{3} \text{ x Area of Base x Height}$$

We know the Area of the base, but we are not given any information about the height.

There is not enough information given to solve this problem, so you should have typed "0" as indicated in the directions

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90553

Base Area= 70 square inches
Length = 10 inches
Width = 7 inches

What is the volume of the rectangular pyramid shown below? (cubic inches)

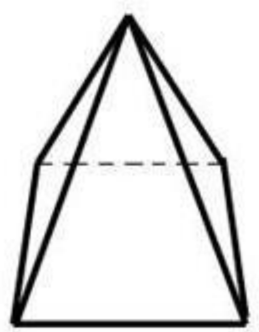


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 0

Scaffold:
Here is a Complete Explanation:

$$V = \frac{1}{3} \times \text{Area of Base} \times \text{Height}$$

We know the Area of the base, but we are not given any information about the height.

There is not enough information given to solve this problem, so you should have typed "0" as indicated in the directions

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #62910

WITH VARIABLES

Volume = %v{volume} cubic inches
Base Area = %v{abase} square inches

What is the height of the rectangular pyramid shown below? (cubic inches)

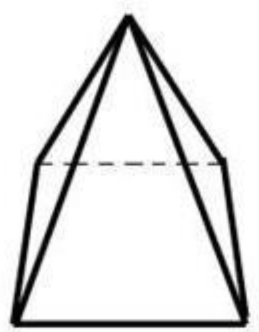


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a Complete Explanation:

$V = \frac{1}{3}$ x Area of Base x Height **We can solve for height**

%v{volume} = $\frac{1}{3}$ x %v{abase} x Height **Substitute given values**

%v{volume} = %v{abase/3} x Height **Simplify**

%v{volume} = %v{abase/3} x Height

$\frac{\text{\%v\{volume\}}}{\text{\%v\{abase/3\}}}$ = Height **Divide both sides by %v{abase/3}**

%v{answer} = Height **Simplify**

The height of the rectangular prism is %v{answer} inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90563

Volume = 40 cubic inches
Base Area = 60 square inches

What is the height of the rectangular pyramid shown below? (cubic inches)

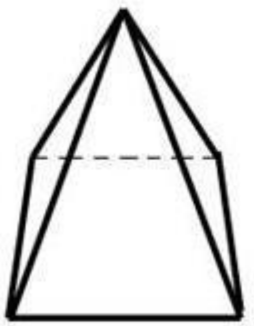


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 2

✗ 0

Scaffold:

Here is a Complete Explanation:

$V = \frac{1}{3} \times$ Area of Base $\times$ Height **We can solve for height**

$40 = \frac{1}{3} \times 60 \times$ Height **Substitute given values**

$40 = 20 \times$ Height **Simplify**

$40 = 20 \times$ Height

$\frac{40}{} =$ Height **Divide both sides by 20**

20

2 = Height **Simplify**

The height of the rectangular prism is 2 inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 62912

WITH VARIABLES

Volume = %v{volume} cubic inches
Height = %v{height} inches
Width = %v{length} inches

What is the length of the rectangular pyramid shown below? (cubic inches)

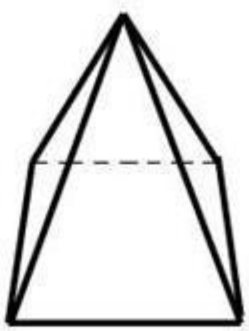


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a Complete Explanation:

V = $\frac{1}{\ }$ x Area of Base x Height

3

Area of Base = Length x Width

$V = \frac{1}{3}$ Length x Width x Height **Substitute area of base formula**

%v{volume} = $\frac{1}{3}$ x Length x %v{length} x %v{height} **Substitute given values**

%v{volume} = %v{length*height/3} x Length **Simplify**

%v{volume} = %v{length*height/3} x Width

$\frac{\%v\{volume\}}{\%v\{length*height/3\}}$ = Width **Divide both sides by %v{length*height/3}**

%v{width}= Width **Simplify**

The width of the rectangular prism is %v{answer} inches

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90574

Volume = 30 cubic inches
Height = 6 inches
Width = 3 inches

What is the length of the rectangular pyramid shown below? (cubic inches)

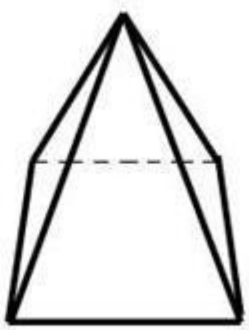


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 5
✗ 0

Scaffold:

Here is a Complete Explanation:

$$V = \frac{1}{3} \times \text{Area of Base} \times \text{Height}$$

Area of Base = Length x Width

$$V = \frac{1}{\ } \text{Length} \times \text{Width} \times \text{Height}$$ **Substitute area of base formula**

3

$30 = \frac{1}{3}$ x Length x 3 x 6 **Substitute given values**

30 = 6 x Length **Simplify**

30 = 6 x Width

$\frac{30}{6}$ = Width **Divide both sides by 6**

5 = Width **Simplify**

The width of the rectangular prism is 5 inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 62913

WITH VARIABLES

A pyrimid shaped tank with a rectangular base is being constructed to store %v{volume} cubic feet of %v{storage}. The base of the tank is %v{length} feet by %v{width} feet. How high must the tank be built to hold the required volume? (answer in feet)

Use 3.14 for Π and round to the nearest hundredth.
If there is not enough information to solve, type 0.

Algebra:

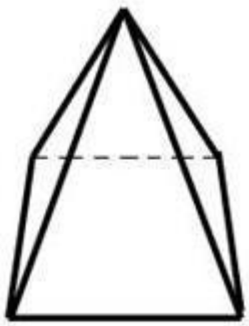
✓ %v{answer}

✗ 0

Scaffold:

Here is a Complete Explanation:

First, draw a picture



INSTANCE # 90584

A pyrimid shaped tank with a rectangular base is being constructed to store 144 cubic feet of Water. The base of the tank is 6 feet by 9 feet. How high must the tank be built to hold the required volume? (answer in feet)

Use 3.14 for Π and round to the nearest hundredth.
If there is not enough information to solve, type 0.

Algebra:

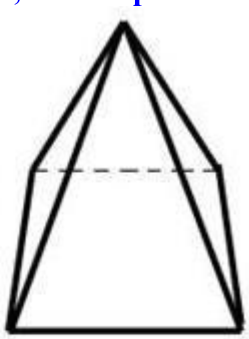
✓ 8

✗ 0

Scaffold:

Here is a Complete Explanation:

First, draw a picture



TEMPLATE #69414

WITH VARIABLES

Volume = %v{volume} cubic inches
Base Area = %v{abase} square inches

What is the height of the triangular pyramid shown below? (cubic inches)

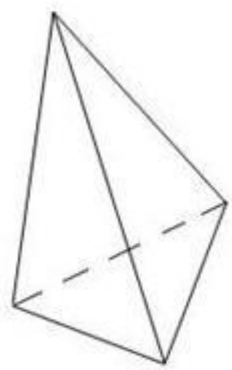


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

V = $\frac{1}{3}$ x Area of Base x Height **We can solve for height**

%v{volume} = $\frac{1}{3}$ x %v{abase} x Height **Substitute given values**

%v{volume} = %v{abase/3} x Height **Simplify**

$\dfrac{\%v\{volume\}}{\%v\{abase/3\}}$ = Height **Divide both sides by %v{abase/3}**

%v{answer} = Height **Simplify**

The height of the triangular pyramid is %v{answer} inches

Type %v{answer}

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90594

Volume = 72 cubic inches
Base Area = 36 square inches

What is the height of the triangular pyramid shown below? (cubic inches)

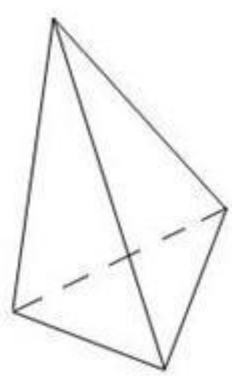


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 6

✘ 0

Scaffold:

$V = \frac{1}{3} \times \text{Area of Base} \times \text{Height}$ **We can solve for height**

$72 = \frac{1}{3} \times 36 \times \text{Height}$ **Substitute given values**

$72 = 12 \times \text{Height}$ **Simplify**

$\frac{72}{12} = \text{Height}$ **Divide both sides by 12**

$6 = \text{Height}$ **Simplify**

The height of the triangular pyramid is 6 inches

Type 6

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

VOLUME OF CONES

TEMPLATE # 60858

WITH VARIABLES

h = %v{height} inches
r = %v{radius} inches

What is the volume of the right circular cone shown below? (cubic inches)

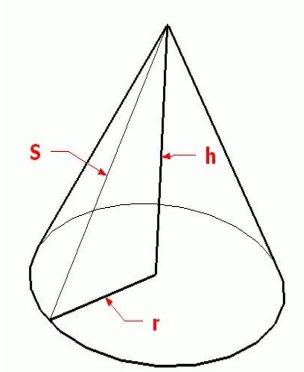


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Here is a complete explanation:

$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$

$$V = \frac{1}{3} \times 3.14 \times \%v\{radius\}^2 \times \%v\{height\}$$ **Substitute given values**

V = %v{volume} **Multiply terms**

V = %v{answer} **Rounded to the nearest hundredth**

The Volume of the Cone is %v{answer} cubic inches.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90604

h = 5 inches
r = 4 inches

What is the volume of the right circular cone shown below? (cubic inches)

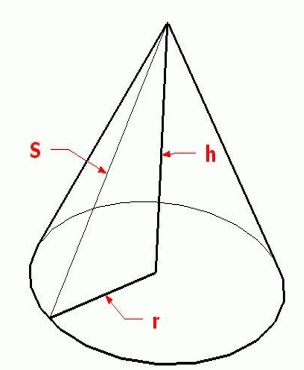


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
83.73
0

Scaffold:

Here is a complete explanation:

$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$

$V = \frac{1}{3} \times 3.14 \times 4^2 \times 5$ **Substitute given values**

$V = 83.7333333333333$ **Multiply terms**

$V = 83.73$ **Rounded to the nearest hundredth**

The Volume of the Cone is 83.73 cubic inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60859

WITH VARIABLES

h = 5 inches
r = 4 inches

What is the volume of the right circular cone shown below? (cubic inches)

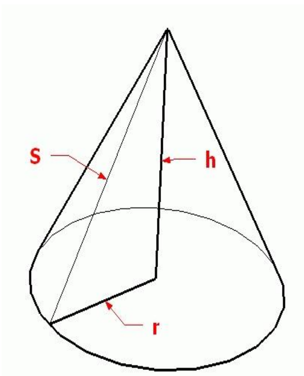


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 83.73
✗ 0

Scaffold:
Here is a complete explanation:

$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$

$$V = \frac{1}{3} \times 3.14 \times 4^2 \times 5$$ **Substitute given values**

3

V = 83.7333333333333 **Multiply terms**

V = 83.73 **Rounded to the nearest hundredth**

The Volume of the Cone is 83.73 cubic inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #90614

Assistment #90614 "90614 - 60214 - Volume of cone (diameter, height)"
h = 6 inches
d = 4 inches

What is the volume of the right circular cone shown below? (cubic inches)

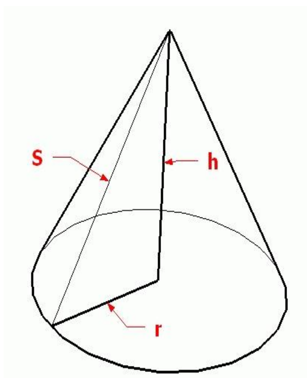


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 25.12
✗ 0

Scaffold:
Here is a complete explanation:

$V = \frac{1}{} \times \prod \times \text{radius}^2 \times \text{height}$ **Volume of Cone**

3

We don't know the Diameter, but Diameter = 2 x Radius, so:

$r = \frac{d}{2}$ **Solve for radius**

$r = \frac{4}{2} = 2$ **Substitute given values**

Now we know the radius = 2

$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$

$V = \frac{1}{3} \times 3.14 \times 2^2 \times 6$ **Substitute values**

$V = 25.12$ **Multiply terms**

$V = 25.12$ **Rounded to the nearest hundredth**

The Volume of the Cone is 25.12 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60860

WITH VARIABLES

A conical %v{var} storage tank is %v{height} feet high and has a radius of %v{radius} feet. What is the maximum volume of %v{var} that can be stored in the tank?

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.

If there is not enough information to solve, type 0.

Algebra:

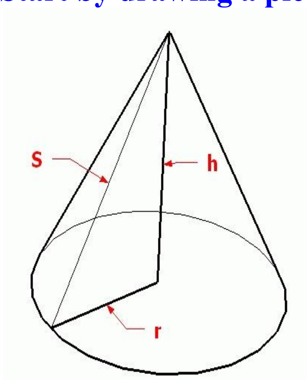
✓ %v{answer}

✗ 0

Scaffold:

Here is a complete explanation:

Start by drawing a picture of the %v{var} storage tank:



$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$ **Equation for the Volume of a cone**

$V = \frac{1}{3} \times 3.14 \times \%v\{radius\}^2 \times \%v\{height\}$ **Substitute given values**

V = %v{volume} **Multiply terms**

V = %v{answer} **Rounded to the nearest hundredth**

The conical %v{var} storage tank can hold %v{answer} cubic feet of %v{var}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90624

A conical Water storage tank is 7 feet high and has a radius of 4 feet. What is the maximum volume of Water that can be stored in the tank?

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

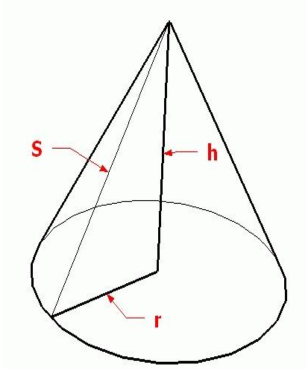
✓ 117.23

✗ 0

Scaffold:

Here is a complete explanation:

Start by drawing a picture of the Water storage tank:



$$V = \frac{1}{3} \times \pi \times \text{radius}^2 \times \text{height}$$ **Equation for the Volume of a cone**

$$V = \frac{1}{3} \times 3.14 \times 4^2 \times 7$$ **Substitute given values**

V = 117.226666666667 **Multiply terms**

V = 117.23 **Rounded to the nearest hundredth**

The conical Water storage tank can hold 117.23 cubic feet of Water.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 61834

WITH VARIABLES

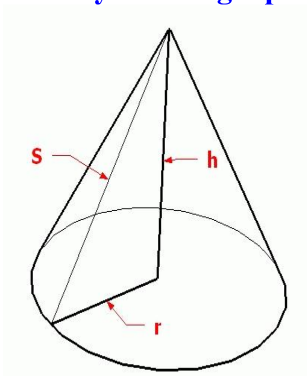
A conical Water storage tank is 7 feet high and has a radius of 4 feet. What is the maximum volume of Water that can be stored in the tank?

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 117.23
✗ 0

Scaffold:
Here is a complete explanation:

Start by drawing a picture of the Water storage tank:



$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$ **Equation for the Volume of a cone**

$$V = \frac{1}{3} \times 3.14 \times 4^2 \times 7$$ **Substitute given values**

$V = 117.226666666667$ **Multiply terms**

$V = 117.23$ **Rounded to the nearest hundredth**

The conical Water storage tank can hold 117.23 cubic feet of Water.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90634

Volume = 70 cubic inches
radius = 3 inches

What is the height of the right circular cone shown below? (inches)

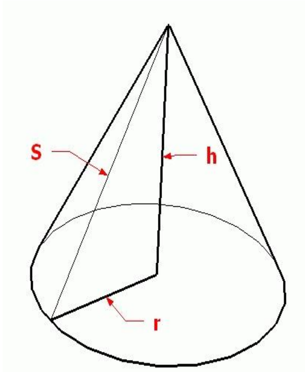


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

- ✓ 7.43
- ✗ 0
- ✓ 7.43-.01
- ✓ 7.43+.01

Scaffold:

Here is a complete explanation:

$V = \frac{1}{3} \times \prod \times radius^2 \times height$ **Volume of Cone Equation**

$70 = \frac{1}{3} \times 3.14 \times 3^2 \times height$ **Substitute given values**

$70 = 9.42 \times height$ **Simplify**

$\frac{70}{9.42} = height$ **Divide both sides by 9.42**

7.43099787685775 = height **Simplify**

7.43 = height **Rounded to the nearest hundredth**

The height of the Cone is 7.43 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60847

WITH VARIABLES

A %v{var} storage tank that is the shape of a **cone** is being designed. The tank must hold %v{volume} cubic feet of %v{var} and has a radius of %v{radius} feet. What is the hight of the tank? (in feet)

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

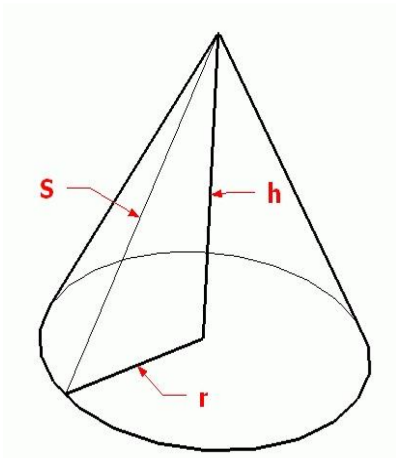
✓ %v{answer}

✗ 0

Scaffold:

Here is a complete explanation:

First Draw a Picture



$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$

$$\%v\{volume\} = \frac{1}{3} \times 3.14 \times \%v\{radius\}^2 \times \text{height}$$ **Substitute given values**

%v{volume} = %v{3.14*rad2/3} x height **Simplify**

$$\frac{\%v\{volume\}}{\%v\{3.14*rad2/3\}} = \text{height}$$ **Divide both sides by %v{3.14*rad2/3}**

%v{height} = height **Multiply terms**

%v{answer} = height **Rounded to the nearest hundredth**

The height of the Cone is %v{answer} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #90644

A Water storage tank that is the shape of a **cone** is being designed. The tank must hold 499 cubic feet of Water and has a radius of 6 feet. What is the hight of the tank? (in feet)

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

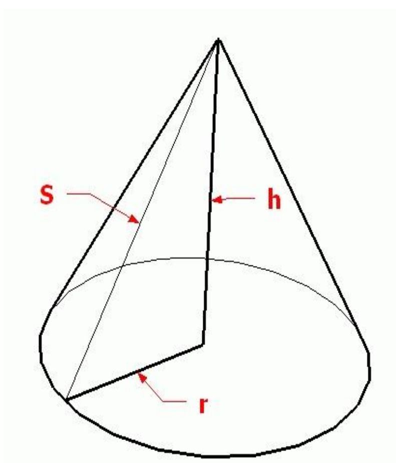
✓ 13.24

✗ 0

Scaffold:

Here is a complete explanation:

First Draw a Picture



$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$

$$499 = \frac{1}{3} \times 3.14 \times 6^2 \times \text{height}$$ **Substitute given values**

$$499 = 37.68 \times \text{height}$$ **Simplify**

$\frac{499}{37.68}$ = height **Divide both sides by 37.68**

13.2430997876858 = height **Multiply terms**

13.24 = height **Rounded to the nearest hundredth**

The height of the Cone is 13.24 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 63529

WITH VARIABLES

Volume = %v{volume} cubic inches
Height = %v{height} inches

What is the diameter of the right circular cone shown below? (inches)

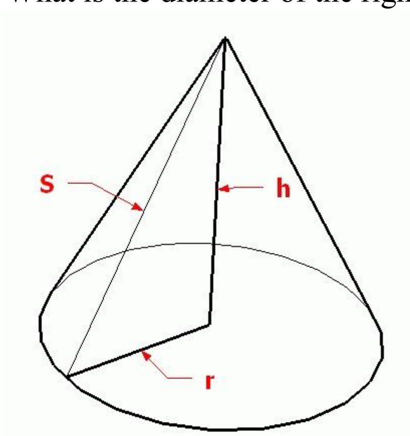


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}
✗ 0
✓ %v{answer}+.01
✓ %v{answer}-.01

Scaffold:

Here is a Complete Explanation

Note: when doing this on a calculator, you can round at each step to the nearest thousandths place to ease calculations as is done in this Explanation.

$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$

$\%v\{volume\} = \frac{1}{3} \times 3.14 \times \text{radius}^2 \times \%v\{height\}$ **Substitute values**

$\%v\{volume\} = \%v\{sim\} \times \text{radius}^2$ **Simplify**

$\frac{\%v\{volume\}}{\%v\{sim\}} = \text{radius}^2$ **Divide both sides by %v{simr}**

$\%v\{rad2\} = \text{radius}^2$ **Simplify**

$\sqrt{(\%v\{rad2r\})} = \text{radius}$ **Take the square root of both sides**

$\%v\{radius\} = \text{radius}$ **Simplify**

Now, we know the radius, and we can solve for the diameter (Diameter = 2 times radius)

2 x %v{radiusr} = diameter **multiply radius by 2**

%v{diameter} = diameter **Simplify**

%v{answer} = height **Rounded to the nearest hundredth**

The height of the Cone is %v{answer} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90654

Volume = 174 cubic inches
Height = 9 inches

What is the diameter of the right circular cone shown below? (inches)

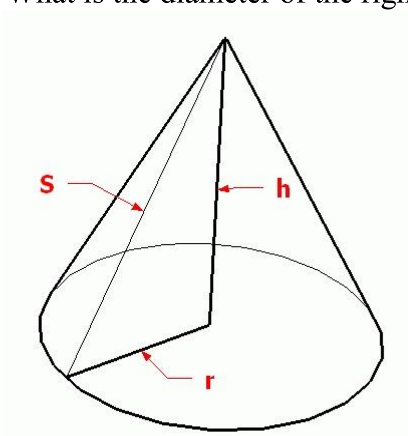


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 17.19
✗ 0
✓ 17.19+.01
✓ 17.19-.01

Scaffold:

Here is a Complete Explanation

Note: when doing this on a calculator, you can round at each step to the nearest thousandths place to ease calculations as is done in this Explanation.

$$V = \frac{1}{3} \times \prod \times \text{radius}^2 \times \text{height}$$

$$174 = \frac{1}{3} \times 3.14 \times \text{radius}^2 \times 9$$ **Substitute values**

$$174 = 9.42 \times \text{radius}^2$$ **Simplify**

$$\frac{174}{9.42} = \text{radius}^2$$ **Divide both sides by 9.42**

$$18.4713375796178 = \text{radius}^2$$ **Simplify**

$$\sqrt{(18.471)} = \text{radius}$$ **Take the square root of both sides**

$$4.29782940327066 = \text{radius}$$ **Simplify**

Now, we know the radius, and we can solve for the diameter (Diameter = 2 times radius)

$$2 \times 4.298 = \text{diameter}$$ **multiply radius by 2**

17.192 = diameter **Simplify**

17.19 = height **Rounded to the nearest hundredth**

The height of the Cone is 17.19 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

VOLUME OF PRISMS

TEMPLATE # 68865

WITH VARIABLES

Base Area: %v{base} square inches
Height: %v{height} inches

What is the Volume of the hexagonal prism shown below? (in cubic inches)

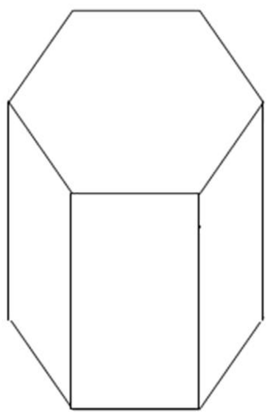


image not to scale

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = %v{base} x %v{height} **Substitute Values**

Volume = %v{volume} **Simplify**

The volume of the prism is %v{volume} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90664

Base Area: 20 square inches
Height: 6 inches

What is the Volume of the hexagonal prism shown below? (in cubic inches)

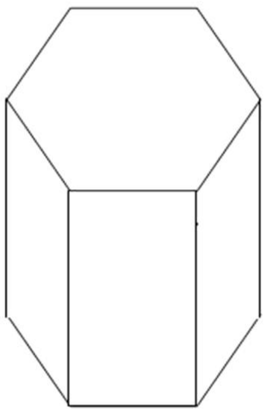


image not to scale

Algebra:

✓ 120

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = 20 x 6 **Substitute Values**

Volume = 120 **Simplify**

The volume of the prism is 120 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68866

WITH VARIABLES

Top Area: %v{base} square inches
Height: %v{height} inches

What is the Volume of the 12-sided prism shown below? (in cubic inches)

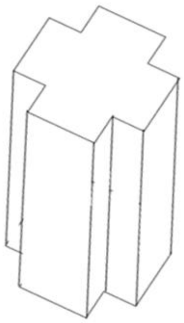


image not to scale

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = Top Area x Height **The Top Area and Base Area are equal in a prism.**

Volume = %v{base} x %v{height} **Substitute Values**

Volume = %v{volume} **Simplify**

The volume of the prism is %v{volume} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90674

Top Area: 24 square inches
Height: 6 inches

What is the Volume of the 12-sided prism shown below? (in cubic inches)

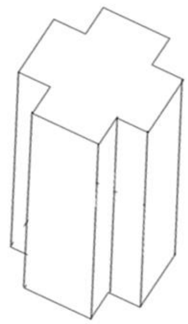


image not to scale

Algebra:

✓ 144

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = Top Area x Height **The Top Area and Base Area are equal in a prism.**

Volume = 24 x 6 **Substitute Values**

Volume = 144 **Simplify**

The volume of the prism is 144 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #68867

WITH VARIABLES

Volume: %v{volume} cubic inches
Height: %v{height} inches

What is the Base Area of the hexagonal prism shown below? (in square inches)

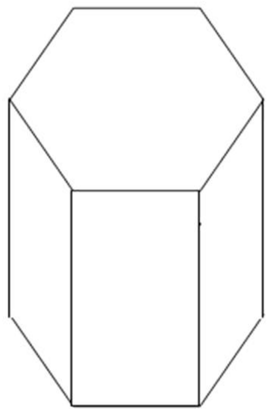


image not to scale

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Volume = Base Area x Height

%v{volume} = Base Area x %v{height} **Substitute Values**

$\frac{\%v\{volume\}}{\%v\{height\}}$ = Base Area **Divide both sides by %v{height}**

%v{base} = Base Area **Simplify**

The Base Area of the prism is %v{base} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90684

Volume: 255 cubic inches
Height: 15 inches

What is the Base Area of the hexagonal prism shown below? (in square inches)

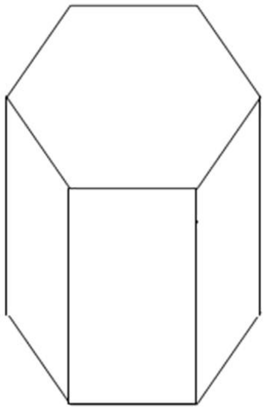


image not to scale

Algebra:

✓ 17

✗ 0

Scaffold:

Volume = Base Area x Height

255 = Base Area x 15 **Substitute Values**

$\frac{255}{15}$ = Base Area **Divide both sides by 15**

17 = Base Area **Simplify**

The Base Area of the prism is 17 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68868

WITH VARIABLES

Volume: %v{volume} cubic inches
Height: %v{height} inches

What is the Top Area of the 5-sided prism shown below? (in square inches)

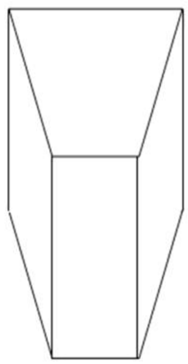


image not to scale

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = Top Area x Height **The Top Area and Base Area are equal in a prism.**

%v{volume} = Top Area x %v{height} **Substitute Values**

$\frac{\%v\{volume\}}{\%v\{height\}}$ = Top Area **Divide both sides by %v{height}**

%v{base} = Top Area **Simplify**

The Top Area of the prism is %v{base} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90694

Volume: 345 cubic inches
Height: 15 inches

What is the Top Area of the 5-sided prism shown below? (in square inches)

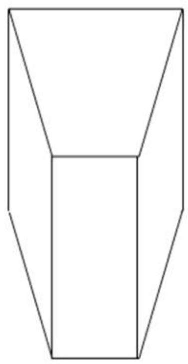


image not to scale

Algebra:

✓ 23

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = Top Area x Height **The Top Area and Base Area are equal in a prism.**

345 = Top Area x 15 **Substitute Values**

$\frac{345}{15}$ = Top Area **Divide both sides by 15**

23 = Top Area **Simplify**

The Top Area of the prism is 23 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #68869

WITH VARIABLES

Volume: %v{volume} cubic inches
Base Area: %v{base} square inches

What is the Height of the 12-sided prism shown below? (in inches)

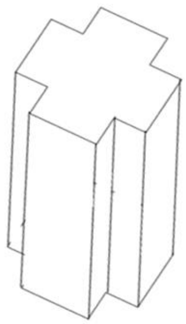


image not to scale

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Volume = Base Area x Height

%v{volume} = %v{base} x Height **Substitute Values**

$$\frac{\%v\{volume\}}{\%v\{base\}} = \text{Height}$$ **Divide both sides by %v{base}**

%v{height} = Height **Simplify**

The Height of the prism is %v{height} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90704

Volume: 240 cubic inches
Base Area: 20 square inches

What is the Height of the 12-sided prism shown below? (in inches)

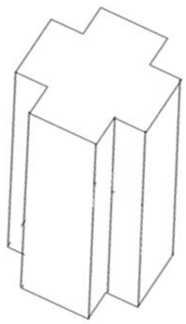


image not to scale

Algebra:

✓ 12

✗ 0

Scaffold:

Volume = Base Area x Height

240 = 20 x Height **Substitute Values**

$\frac{240}{20}$ = Height **Divide both sides by 20**

12 = Height **Simplify**

The Height of the prism is 12 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68870

WITH VARIABLES

Volume: %v{volume} cubic inches
Top Area: %v{base} square inches

What is the Height of the 5-sided prism shown below? (in inches)

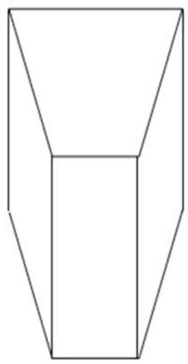


image not to scale

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = Top Area x Height **The Top Area and Base Area are equal in a prism.**

%v{volume} = %v{base} x Height **Substitute Values**

$\frac{\%v\{volume\}}{\%v\{base\}}$ = Height **Divide both sides by %v{base}**

%v{height} = Height **Simplify**

The Height of the prism is %v{height} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTNANCE # 90714

Volume: 100 cubic inches
Top Area: 10 square inches

What is the Height of the 5-sided prism shown below? (in inches)

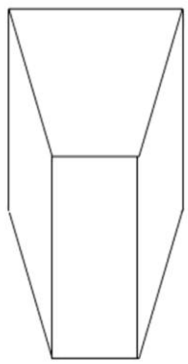


image not to scale

Algebra:

✓ 10

✗ 0

Scaffold:

Volume = Base Area x Height

Volume = Top Area x Height **The Top Area and Base Area are equal in a prism.**

100 = 10 x Height **Substitute Values**

$\frac{100}{10}$ = Height **Divide both sides by 10**

10 = Height **Simplify**

The Height of the prism is 10 inches.

Multiple choice:

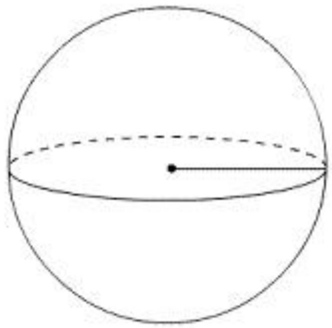
✓ Ok. I have studied this example and am ready to get a new problem.

VOLUME OF SPHERES

TEMPLATE #60192

WITH VARIABLES

The sphere below has a radius of %v{radius} inches.



What is the volume of this sphere (in cubic inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation:

$$V = \frac{4}{3} \Pi * \text{radius}^3$$

$$V = \frac{4}{3} 3.14 * \%v\{radius\}^3$$ **Substitute the given value for the radius**

V = %v{ans_f} **Simplify**

V = %v{answer} **Round to the nearest tenth**

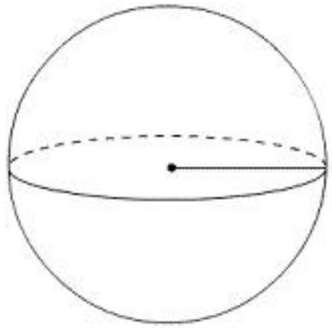
The Volume of the Sphere is %v{answer} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90724

The sphere below has a radius of 1 inches.



What is the volume of this sphere (in cubic inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 4.19

Scaffold:

Here is a complete explanation:

$$V = \frac{4}{3} \Pi * \text{radius}^3$$

$$V = \frac{4}{3} 3.14 * 1^3$$ **Substitute the given value for the radius**

V = 4.18666666666667 **Simplify**

V = 4.19 **Round to the nearest tenth**

The Volume of the Sphere is 4.19 cubic inches.

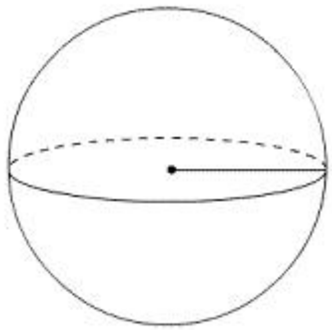
Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #60193

WITH VARIABLES

The sphere below has a diameter of %v{diameter} inches.



What is the volume of this sphere (in cubic inches)?
Use 3.14 for Π and round to the nearest hundredth.

Algebra:
✓ %v{answer}

Scaffold:
Here is a complete explanation:

$$V = \frac{4}{3} \Pi * \text{radius}^3$$

We can find the Radius from the Diameter:
Diameter = 2 x Radius

$$\text{Radius} = \frac{\text{Diameter}}{2}$$ **Solve for Radius**

$$\text{Radius} = \frac{\%v\{diameter\}}{2} = \%v\{radius\}$$ **Plug in Diameter and Simplify**

Now use the Radius in the Volume formula:

$$V = \frac{4}{3} 3.14 * \%v\{radius\}^3$$

V = %v{ans_f} **Simplify**

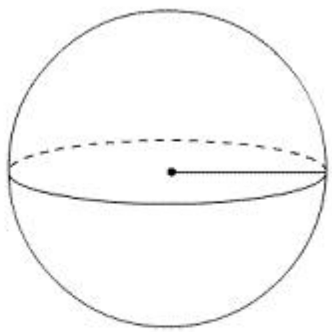
V = %v{answer} **Round to the nearest tenth**

The Volume of the Sphere is %v{answer} cubic inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90734

The sphere below has a diameter of 14 inches.



What is the volume of this sphere (in cubic inches)?
Use 3.14 for Π and round to the nearest hundredth.

Algebra:
✓ 1436.03

Scaffold:
Here is a complete explanation:

$$V = \frac{4}{3}\Pi * \text{radius}^3$$

We can find the Radius from the Diameter:
Diameter = 2 x Radius

$$\text{Radius} = \frac{\text{Diameter}}{2}$$ **Solve for Radius**

$$\text{Radius} = \frac{14}{2} = 7$$ **Plug in Diameter and Simplify**

Now use the Radius in the Volume formula:

$$V = \frac{4}{3} 3.14 * 7^3$$

V = 1436.02666666667 **Simplify**

V = 1436.03 **Round to the nearest tenth**

The Volume of the Sphere is 1436.03 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60194

WITH VARIABLES

A spherical tank will be used for the storage of %v{storage}. The diameter of the %v{storage} tank is %v{diameter} feet.
What is the volume of %v{storage} that the tank can hold (in cubic feet)?
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation:

Volume of A Sphere: $V = \frac{4}{3} \Pi * radius^3$

Diameter (D) = 2 x Radius (R)

$Radius = \frac{Diameter}{2}$ **Solve for Radius**

$Radius = \frac{\%v\{diameter\}}{2} = \%v\{radius\}$ **Plug in Diameter and Simplify**

Now, use the Volume formula and solve

$V = \frac{4}{3} \Pi * radius^3$

$V = \frac{4}{3} 3.14 * \%v\{radius\}^3$

V = %v{ans_f} **Simplify**

V = %v{answer} **Round to the nearest tenth**

The Volume of the Sphere is %v{answer} cubic feet and therefore it can hold %v{answer} cubic feet of %v{storage}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 90744

A spherical tank will be used for the storage of Water. The diameter of the Water tank is 14 feet. What is the volume of Water that the tank can hold (in cubic feet)?
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 1436.03

Scaffold:

Here is a complete explanation:

Volume of A Sphere: V = 4 $\Pi * radius^3$

3

Diameter (D) = 2 x Radius (R)

$$\text{Radius} = \frac{\text{Diameter}}{2}$$ **Solve for Radius**

$$\text{Radius} = \frac{14}{2} = 7$$ **Plug in Diameter and Simplify**

Now, use the Volume formula and solve

$$V = \frac{4}{3}\Pi * \text{radius}^3$$

$$V = \frac{4}{3} 3.14 * 7^3$$

V = 1436.02666666667 **Simplify**

V = 1436.03 **Round to the nearest tenth**

The Volume of the Sphere is 1436.03 cubic feet and therefore it can hold 1436.03 cubic feet of Water.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 60195

WITH VARIABLES

A spherical tank will be used for the storage of %v{storage}. The radius of the %v{storage} tank is %v{radius} feet.
What is the volume of %v{storage} that the tank can hold (in cubic feet)?
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{answer}

Scaffold:

Here is a complete explanation:

$$V = \frac{4}{3} \Pi * \text{radius}^3$$

$$V = \frac{4}{3} 3.14 * \%v\{radius\}^3$$

V = %v{ans_f} **Simplify**

V = %v{answer} **Round to the nearest tenth**

The Volume of the spherical %v{storage} tank is %v{answer} cubic feet, therefore it can store %v{answer} cubic feet of %v{storage}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90754

A spherical tank will be used for the storage of Water. The radius of the Water tank is 7 feet. What is the volume of Water that the tank can hold (in cubic feet)?
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 1436.03

Scaffold:

Here is a complete explanation:

V = 4 Π * radius^3

$$\frac{\quad}{3}$$

$$V = \frac{4}{3}\ 3.14 * 7^3$$

$V = 1436.02666666667$ **Simplify**

$V = 1436.03$ **Round to the nearest tenth**

The Volume of the spherical Water tank is 1436.03 cubic feet, therefore it can store 1436.03 cubic feet of Water.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

VOLUME OF RECTANGULAR PRISMS

TEMPLATE # 68871

WITH VARIABLES

Height = %v{height} inches
Base Area = %v{abase} square inches

What is the volume of the rectangular prism shown below? (cubic inches)

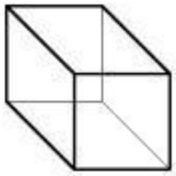


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

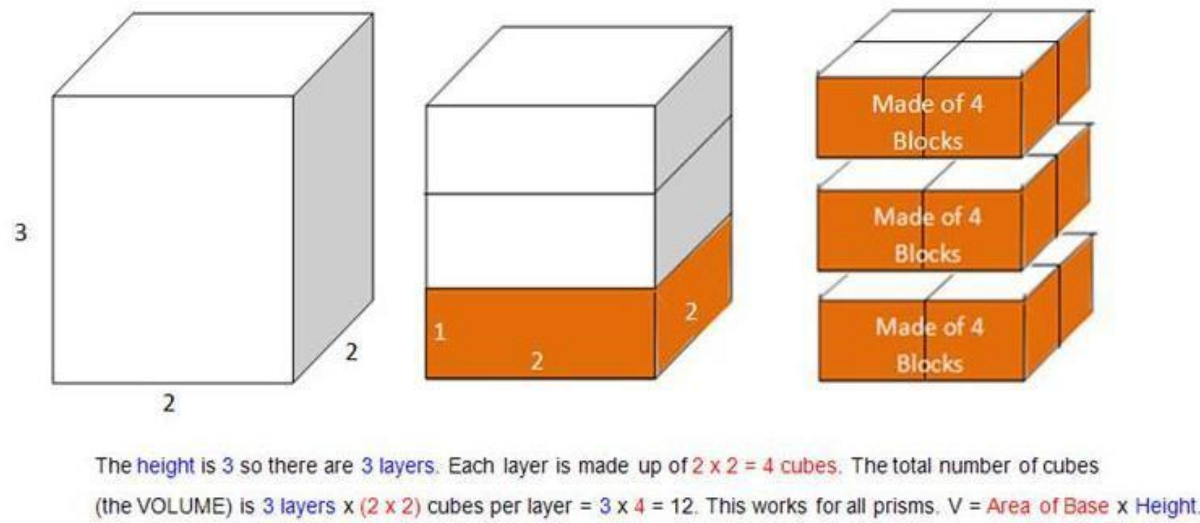
✓ %v{answer}

✗ 0

Scaffold:

V = Area of Base x Height

The following example shows how to get to the Volume formula:



V = Area of Base x Height

V = %v{abase} * %v{height} **Substitute given values**

V = %v{answer} **Multiply Terms**

The Volume of the Rectangular Prism is %v{answer} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90764

Height = 3 inches

Base Area = 10 square inches

What is the volume of the rectangular prism shown below? (cubic inches)

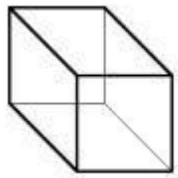


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

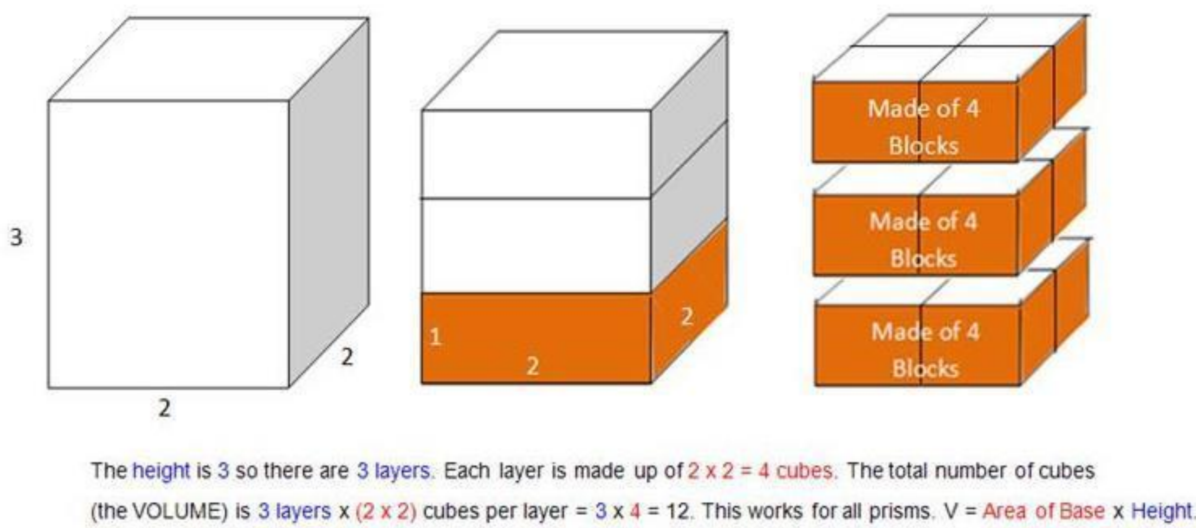
✓ 30

✗ 0

Scaffold:

V = Area of Base x Height

The following example shows how to get to the Volume formula:



V = Area of Base x Height

V = 10 * 3 **Substitute given values**

V = 30 **Multiply Terms**

The Volume of the Rectangular Prism is 30 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68872

WITH VARIABLES

Height = %v{height} inches
Length = %v{length} inches
Width = %v{width} inches

What is the volume of the rectangular prism shown below? (cubic inches)

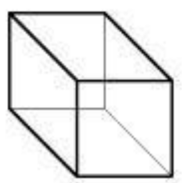


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

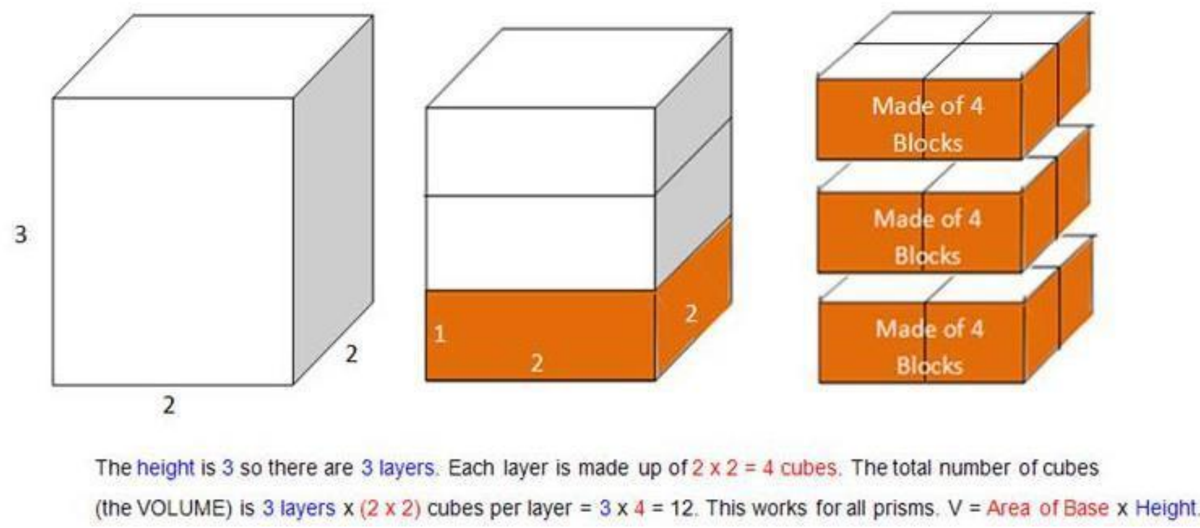
✓ %v{answer}

✗ 0

Scaffold:

V = Area of Base x Height

The following example shows how to get the Volume Formula:



We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

A = %v{length} * %v{width} **Substitute given values**

A = %v{abase} **Multiply Terms**

Remember, from the last step Base Area = %v{abase}.

V = %v{abase} x %v{height} **Substitute given values**

V =%v{volume} **Multiply Terms**

The Volume of the Rectangular Prism is %v{answer} cubic inches.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90774

Height = 5 inches
Length = 1 inches
Width = 8 inches

What is the volume of the rectangular prism shown below? (cubic inches)

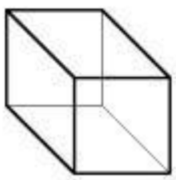


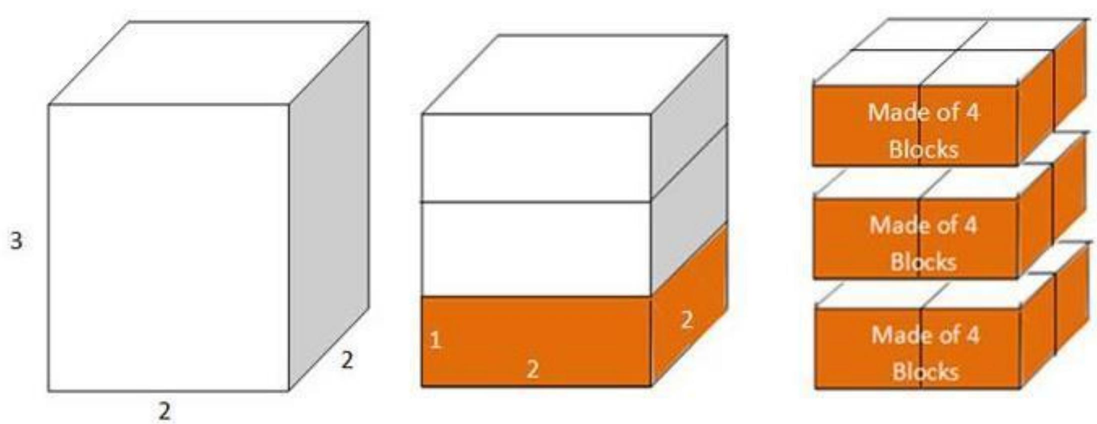
Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
40
0

Scaffold:
V = Area of Base x Height

The following example shows how to get the Volume Formula:



The height is 3 so there are 3 layers. Each layer is made up of 2 x 2 = 4 cubes. The total number of cubes (the VOLUME) is 3 layers x (2 x 2) cubes per layer = 3 x 4 = 12. This works for all prisms. V = Area of Base x Height.

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

A = 1 * 8 **Substitute given values**

A = 8 **Multiply Terms**

Remember, from the last step Base Area = 8.

V = 8 x 5 **Substitute given values**

V = 40 **Multiply Terms**

The Volume of the Rectangular Prism is 40 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68873

WITH VARIABLES

A tank the shape of a rectangular prism is being constructed that will will be used for the storage of %v{storage}. The base of the tank is %v{length} feet by %v{width} feet and the tank is %v{height} feet high. How much %v{storage} can the tank hold (in cubic inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

First, draw a picture and label:

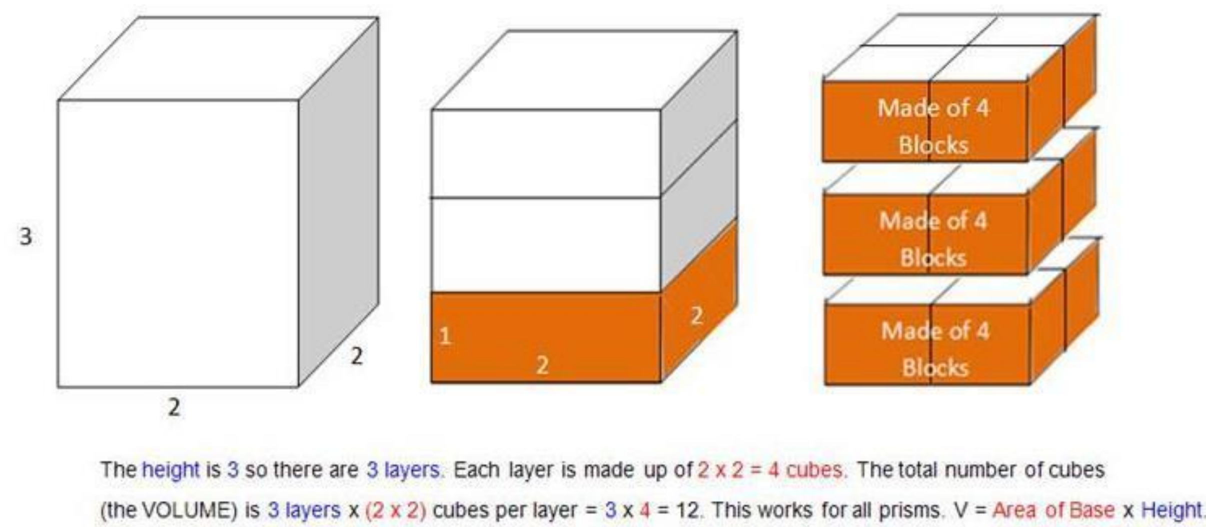
h=%v{height}

w = %v{width}

l = %v{length}

Volume = Area of Base x Height

Now, the solution:



V = Area of Base x Height

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

A = %v{length} * %v{width} **Substitute given values**

A = %v{abase} **Multiply Terms**

Now find the volume
V = Area of Base x Height

V = %v{abase} * %v{height} **Substitute given values**

V =%v{answer} **Multiply Terms**

The Volume of %v{storage} that the tank can hold is %v{answer} cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90784

A tank the shape of a rectangular prism is being constructed that will will be used for the storage of Water. The base of the tank is 4 feet by 9 feet and the tank is 3 feet high. How much Water can the tank hold (in cubic inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 108

✗ 0

Scaffold:

First, draw a picture and label:

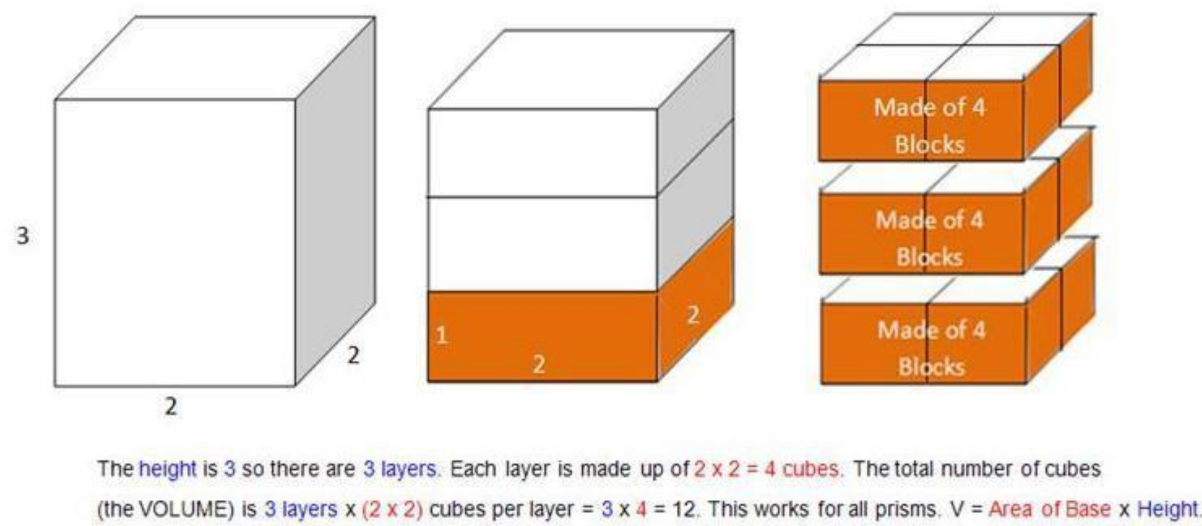
h=3

w = 9

l = 4

Volume = Area of Base x Height

Now, the solution:



V = Area of Base x Height

We are not given the Base Area, but we can calculate it from the given information.

Remember, $A_{rectangle}$= Length x Width

A = 4 * 9 **Substitute given values**

A = 36 **Multiply Terms**

Now find the volume
V = Area of Base x Height

V = 36 * 3 **Substitute given values**

V = 108 **Multiply Terms**

The Volume of Water that the tank can hold is 108 cubic inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #68874

WITH VARIABLES

Base Area= %v{abase} square inches
Length = %v{length} inches
Width = %v{width} inches

What is the volume of the rectangular prism shown below? (cubic inches)

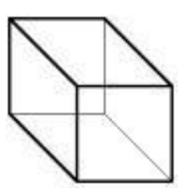


Image not to scale.

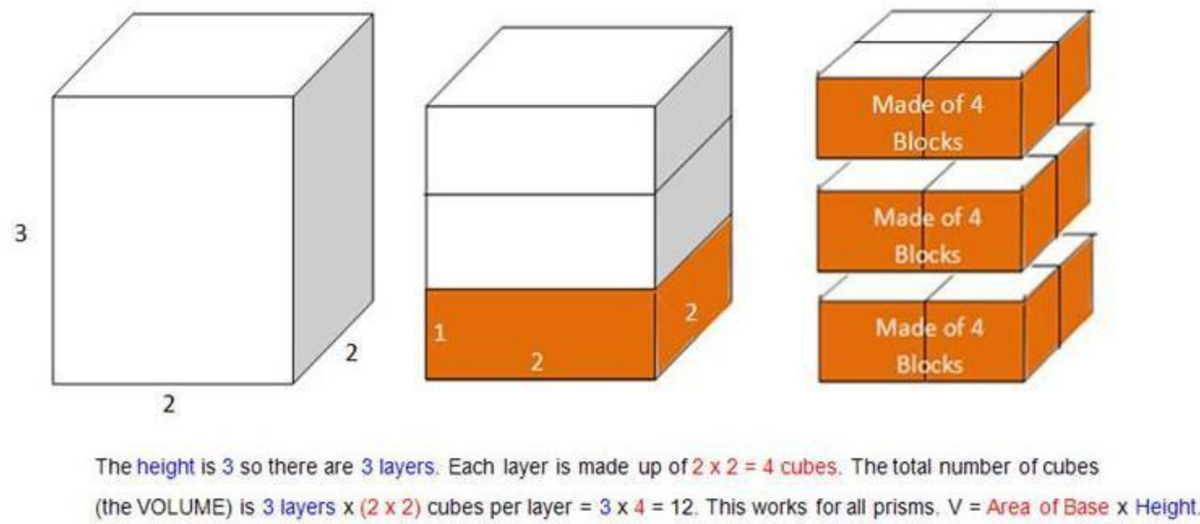
Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 0

Scaffold:

The following example shows how to get the Volume formula:



V = Area of Base x Height

We know the Area of the base, but we are not given any information about the height.

There is not enough information given to solve this problem.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90794

Base Area= 10 square inches
Length = 5 inches
Width = 2 inches

What is the volume of the rectangular prism shown below? (cubic inches)

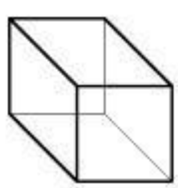


Image not to scale.

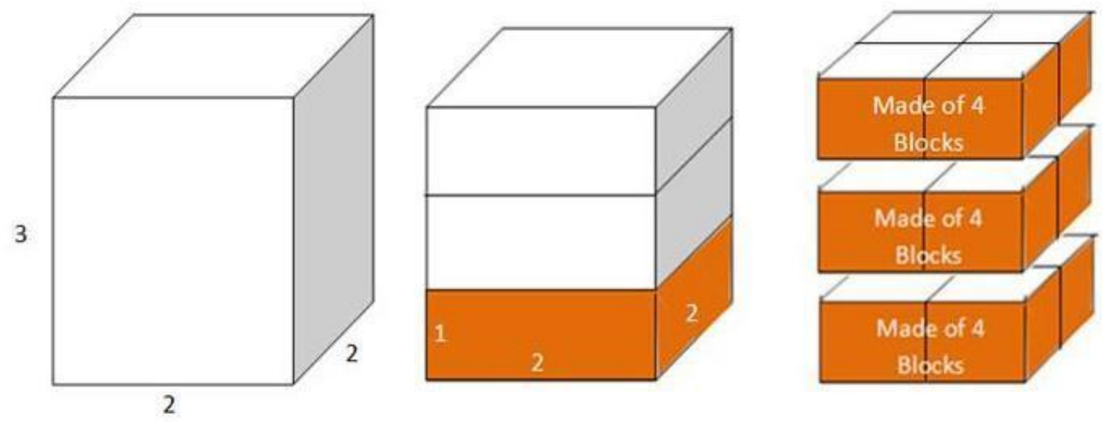
Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 0

Scaffold:

The following example shows how to get the Volume formula:



The height is 3 so there are 3 layers. Each layer is made up of 2 x 2 = 4 cubes. The total number of cubes (the VOLUME) is 3 layers x (2 x 2) cubes per layer = 3 x 4 = 12. This works for all prisms. V = Area of Base x Height.

V = Area of Base x Height

We know the Area of the base, but we are not given any information about the height.

There is not enough information given to solve this problem.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68875

WITH VARIABLES

Volume = %v{volume} cubic inches
Base Area = %v{abase} square inches

What is the height of the rectangular prism shown below? (cubic inches)

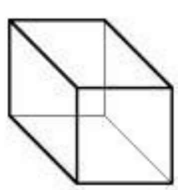


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.

If there is not enough information to solve, type 0.

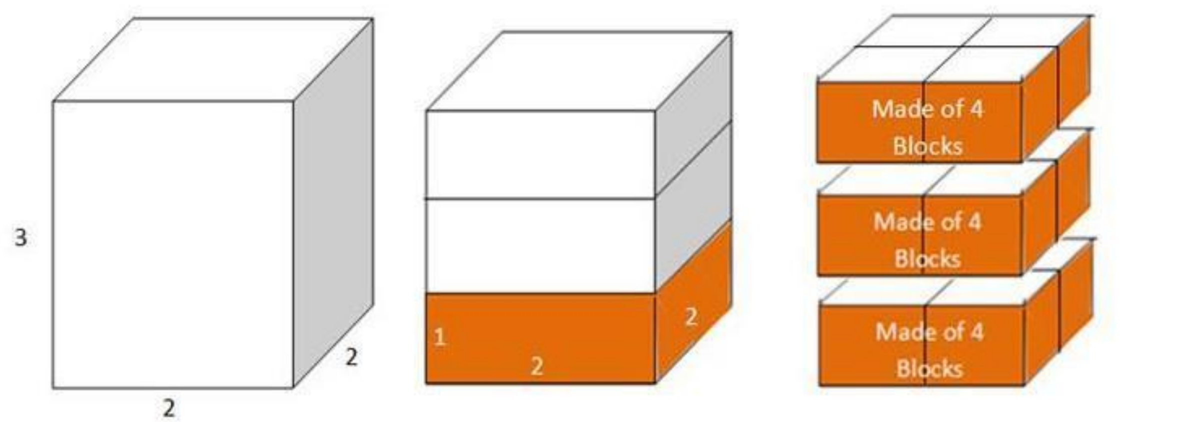
Algebra:

✔ %v{answer}

✘ 0

Scaffold:

The following example shows how to get the Volume formula:



The height is 3 so there are 3 layers. Each layer is made up of 2 x 2 = 4 cubes. The total number of cubes (the VOLUME) is 3 layers x (2 x 2) cubes per layer = 3 x 4 = 12. This works for all prisms. V = Area of Base x Height.

V = Area of Base x Height **We can solve for height**

%v{volume} = %v{abase} x Height **Substitute given values**

$$\frac{\%v\{volume\}}{\%v\{abase\}} = \text{Height}$$ **Divide both sides by %v{abase}**

%v{answer} = Height **Simplify**

The height of the rectangular prism is %v{answer} inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90804

Volume = 144 cubic inches
Base Area = 24 square inches

What is the height of the rectangular prism shown below? (cubic inches)

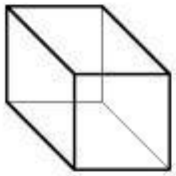
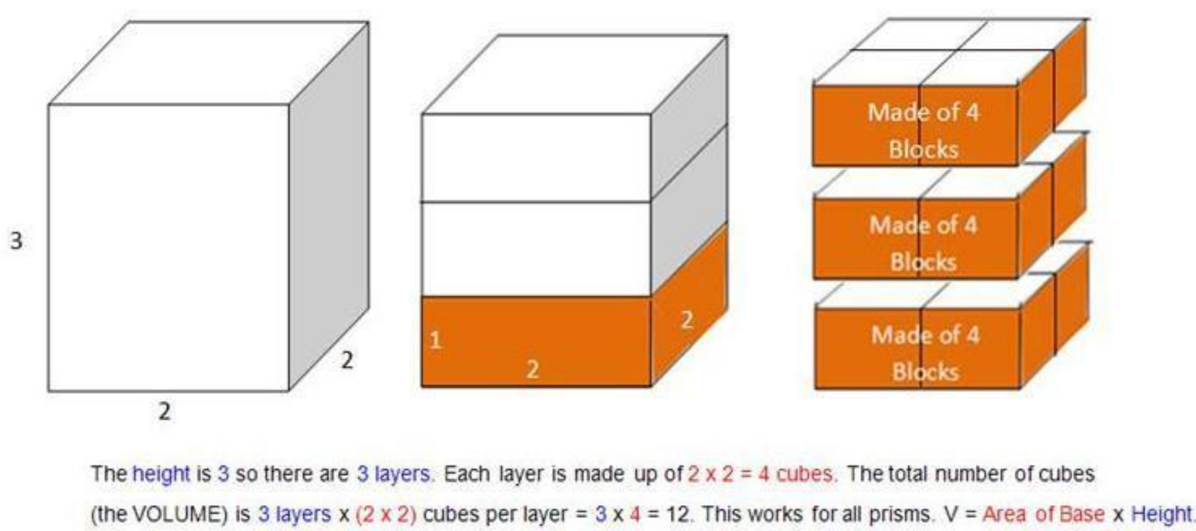


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 6
✗ 0

Scaffold:
The following example shows how to get the Volume formula:



V = Area of Base x Height **We can solve for height**

144 = 24 x Height **Substitute given values**

$\frac{144}{24}$ = Height **Divide both sides by 24**

6 = Height **Simplify**

The height of the rectangular prism is 6 inches

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68876

WITH VARIABLES

Volume = %v{volume} cubic inches
Height = %v{height} inches
Length = %v{length} inches

What is the width of the rectangular prism shown below? (cubic inches)

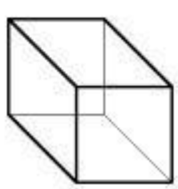
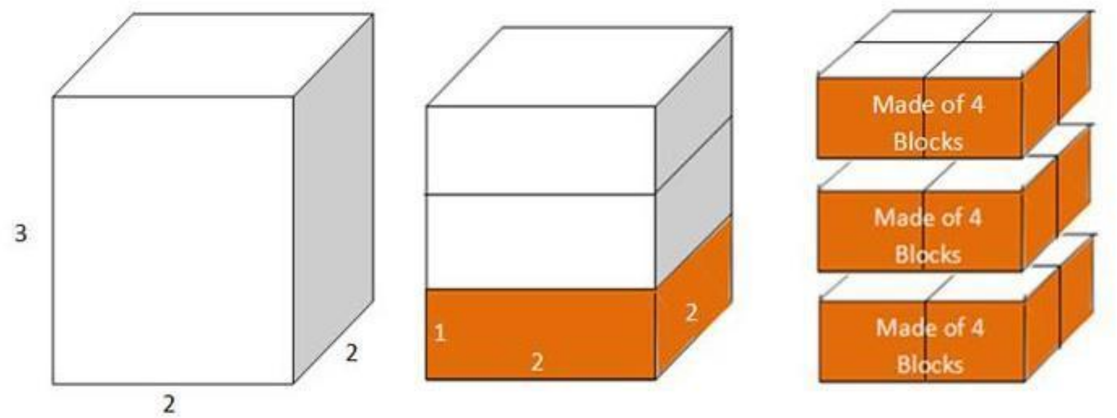


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ %v{answer}
✗ 0

Scaffold:
The following example shows how to get the Volume formula:



The height is 3 so there are 3 layers. Each layer is made up of 2 x 2 = 4 cubes. The total number of cubes (the VOLUME) is 3 layers x (2 x 2) cubes per layer = 3 x 4 = 12. This works for all prisms. V = Area of Base x Height.

V = Area of Base x Height

Area of Base = Length x Width

Volume = Length x Width x Height **Substitute Area of Base formula**

%v{volume} = %v{length} x Width x %v{height} **Substitute given values**

%v{volume} = %v{length*height} x Width **Simplify**

$$\frac{\%v\{volume\}}{\%v\{length*height\}} = \text{Width}$$

Divide both sides by %v{length*height}

%v{width}= Width **Simplify**

The width of the rectangular prism is %v{answer} inches

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90814

Volume = 576 cubic inches
Height = 9 inches
Length = 8 inches

What is the width of the rectangular prism shown below? (cubic inches)

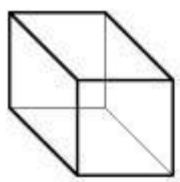


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

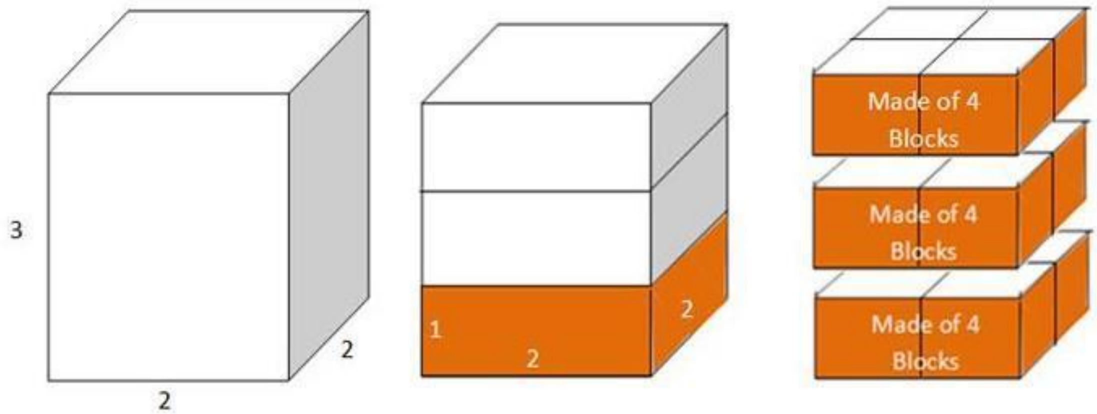
Algebra:

8

0

Scaffold:

The following example shows how to get the Volume formula:



The height is 3 so there are 3 layers. Each layer is made up of 2 x 2 = 4 cubes. The total number of cubes (the VOLUME) is 3 layers x (2 x 2) cubes per layer = 3 x 4 = 12. This works for all prisms. V = Area of Base x Height.

V = Area of Base x Height

Area of Base = Length x Width

Volume = Length x Width x Height **Substitute Area of Base formula**

576 = 8 x Width x 9 **Substitute given values**

576 = 72 x Width **Simplify**

$\frac{576}{72}$ = Width **Divide both sides by 72**

8 = Width **Simplify**

The width of the rectangular prism is 8 inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68877

WITH VARIABLES

A rectangular prism shaped tank is being constructed to store %v{volume} cubic feet of %v{storage}. The base of the tank is %v{length} feet by %v{width} feet. How high must the tank be built to hold the required volume? (answer in feet)

Use 3.14 for Π and round to the nearest hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

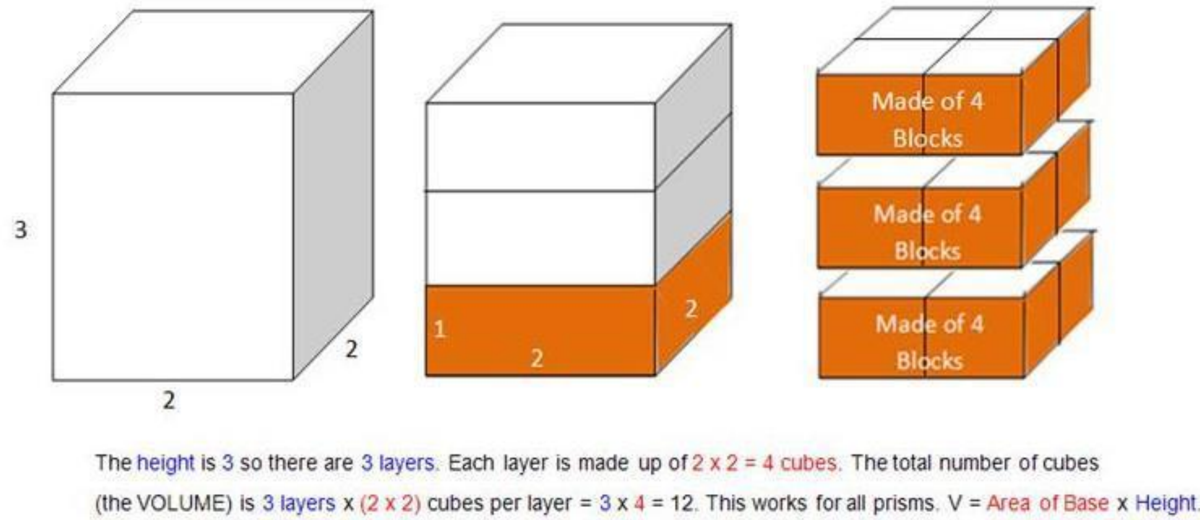
First, draw a picture and label: **h = ?**

w = %v{width}
l = %v{length}

Volume = %v{volume}

Now, lets solve the problem:

The following example shows how to get to the Volume formula:



V = Area of Base x Height

Area of Base = Length x Width

Volume = Length x Width x Height **Substitute Area of Base formula**

%v{volume} = %v{length} x %v{width} x Height **Substitute given values**

%v{volume} = %v{abase} x Height **Simplify**

$\frac{\%v\{volume\}}{\%v\{abase\}}$ = Height **Divide both sides by %v{abase}**

%v{height}= Height **Simplify**

The %v{storage} storage tank must be %v{height} feet tall to hold the required %v{volume} cubic feet of %v{storage}.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90824

A rectangular prism shaped tank is being constructed to store 240 cubic feet of Water. The base of the tank is 5 feet by 8 feet. How high must the tank be built to hold the required volume? (answer in feet)

Use 3.14 for Π and round to the nearest hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 6

✗ 0

Scaffold:

First, draw a picture and label:

h = ?

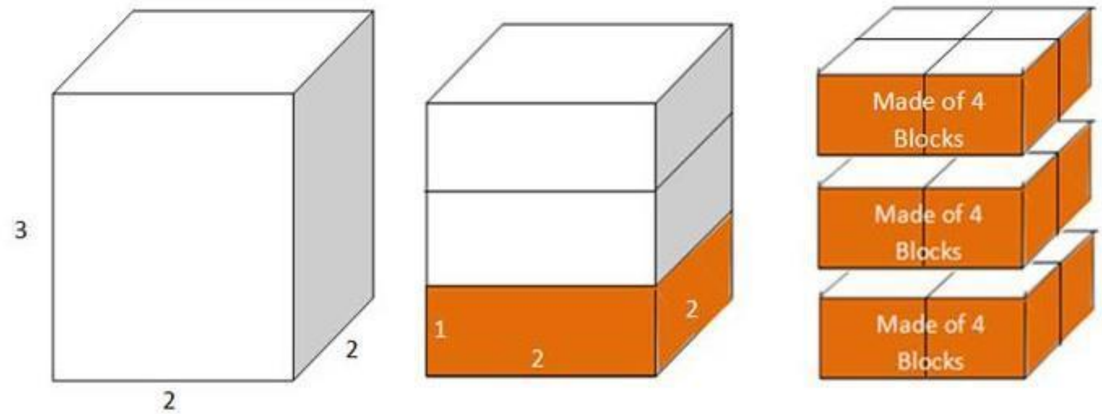
w = 8

l = 5

Volume = 240

Now, lets solve the problem:

The following example shows how to get to the Volume formula:



The height is 3 so there are 3 layers. Each layer is made up of 2 x 2 = 4 cubes. The total number of cubes (the VOLUME) is 3 layers x (2 x 2) cubes per layer = 3 x 4 = 12. This works for all prisms. V = Area of Base x Height.

V = Area of Base x Height

Area of Base = Length x Width

Volume = Length x Width x Height **Substitute Area of Base formula**

240 = 5 x 8 x Height **Substitute given values**

240 = 40 x Height **Simplify**

$\frac{240}{40}$ = Height **Divide both sides by 40**

6 = Height **Simplify**

The Water storage tank must be 6 feet tall to hold the required 240 cubic feet of Water.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

Appendix F: Surface Area ASSISTments

Original Content Created by Steven Southard

SURFACE AREA OF A CYLINDER

TEMPLATE # 68878

WITH VARIABLES

Radius = %v{radius} inches
Height = %v{height} inches

What is the Surface Area of the Cylinder shown below? (square inches)

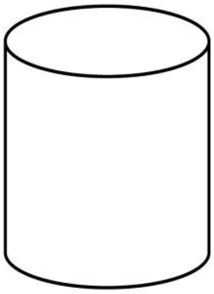


Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

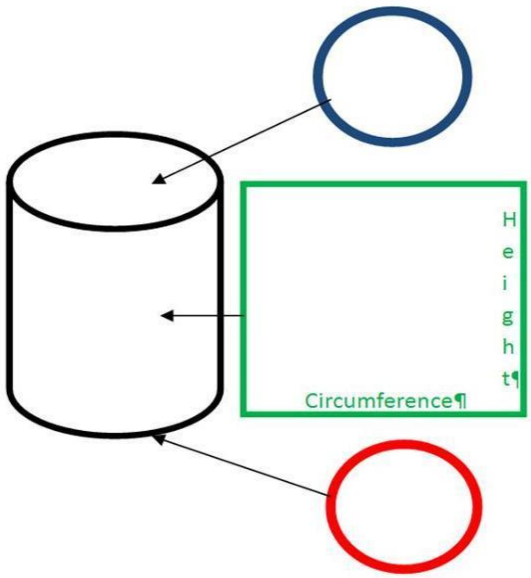
Algebra:

✓ %v{answer}

✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = Pi x r^2 + Pi x r^2 + 2 x Pi x r x h

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

SA = 3.14 x %v{radius}^{2} + 3.14 x %v{radius}^{2} + 2 x 3.14 x %v{radius} x %v{height} **Substitute Values**

SA = %v{sa} **Simplify**

The Surface Area of the cylinder is %v{sa} square inches

Multiple choice:

- Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90834

Radius = 6 inches
Height = 3 inches

What is the Surface Area of the Cylinder shown below? (square inches)

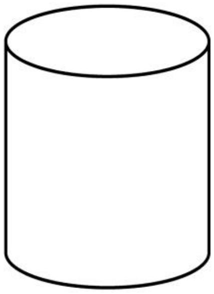


Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

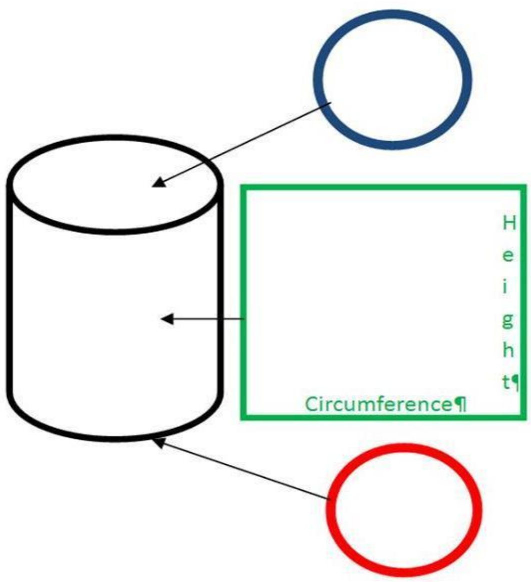
Algebra:

✓ 339.12

✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = Pi x r ^{2} + Pi x r^2 + 2 x Pi x r x h

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

SA = 3.14 x 6^2 + 3.14 x 6^2 + 2 x 3.14 x 6 x 3 **Substitute Values**

SA = 339.12 **Simplify**

The Surface Area of the cylinder is 339.12 square inches

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68879

WITH VARIABLES

Diameter= %v{diameter} inches
Height = %v{height} inches

What is the Surface Area of the Cylinder shown below? (square inches)

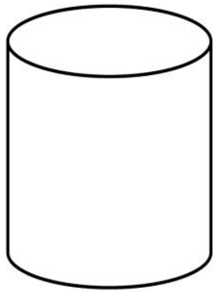


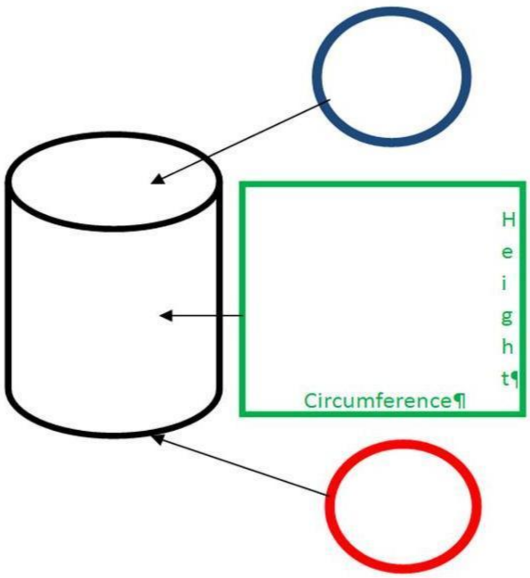
Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

Algebra:
✓ %v{answer}
✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = π Pi x r ^{2} + Pi x r^2 + 2 x Pi x r x h

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

We need the Radius, but we are only given the Diameter. We can solve for the Radius:

$$r = \frac{d}{2}$$

$$r = \frac{\%v\{diameter\}}{2} = \%v\{radius\}$$

Now that we know the radius, we can use it in the Surface Area formula.

SA = 3.14 x %v{radius}^{2} + 3.14 x %v{radius}^{2} + 2 x 3.14 x %v{radius} x %v{height}

Substitute Values

SA = %v{sa}

Simplify

The Surface Area of the cylinder is %v{sa} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90844

Diameter= 2 inches
Height = 6 inches

What is the Surface Area of the Cylinder shown below? (square inches)

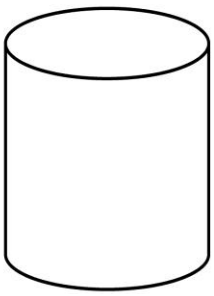


Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

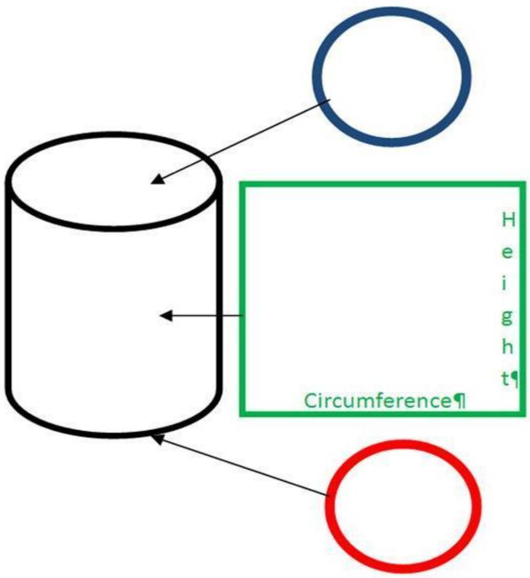
Algebra:

✓ 43.96

✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = $\text{Pi} \times r^2 + \text{Pi} \times r^2 + 2 \times \text{Pi} \times r \times h$

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

We need the Radius, but we are only given the Diameter. We can solve for the Radius:

$$r = \frac{d}{2}$$

$$r = \frac{2}{2} = 1$$

Now that we know the radius, we can use it in the Surface Area formula.

SA = $3.14 \times 1^2 + 3.14 \times 1^2 + 2 \times 3.14 \times 1 \times 6$ **Substitute Values**

SA = 43.96 **Simplify**

The Surface Area of the cylinder is 43.96 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68880

WITH VARIABLES

The outside of a new %v{type} storage tank that is cylinder-shaped needs to be painted. Assume that the entire tank outside of the tank must be painted before it is installed. What is the surface area of the storage tank if the tank has a diameter of %v{diameter} feet and is %v{height} feet high?

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

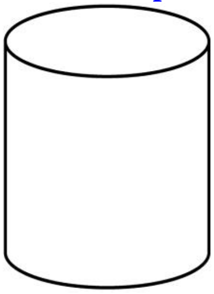
Algebra:

✓ %v{answer}

✗ 0

Scaffold:

First draw a picture!

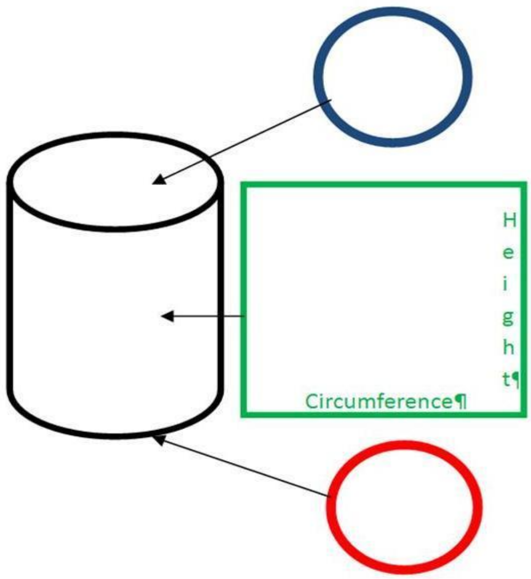


Height: %v{height}
Diameter: %v{diameter}

We must calculte the Surface Area:

SA $A_{Base} + A_{Top} + A_{Side}$

=



SA = Pi x r ^{2} + Pi x r^2 + 2 x Pi x r x h

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

We need the Radius, but we are only given the Diameter. We can solve for the Radius:

$$r = \frac{d}{2}$$

$$r = \frac{\%v\{diameter\}}{2} = \%v\{radius\}$$ **We can use it in the Surface Area formula.**

SA = 3.14 x %v{radius}^{2} + 3.14 x %v{radius}^{2} + 2 x 3.14 x %v{radius} x %v{height} **Substitute Values**

SA = %v{base} + %v{base} + %v{side} **Simplify**

SA = %v{sa} **Simplify**

The Surface Area of the cylinder is %v{sa} square inches

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

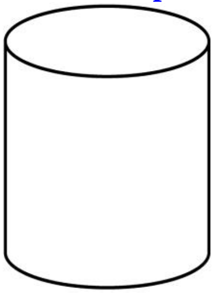
INSTANCE # 90854

The outside of a new Water storage tank that is cylinder-shaped needs to be painted. Assume that the entire tank outside of the tank must be painted before it is installed. What is the surface area of the storage tank if the tank has a diameter of 6 feet and is 1 feet high?

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

Algebra:
✓ 75.36
✗ 0

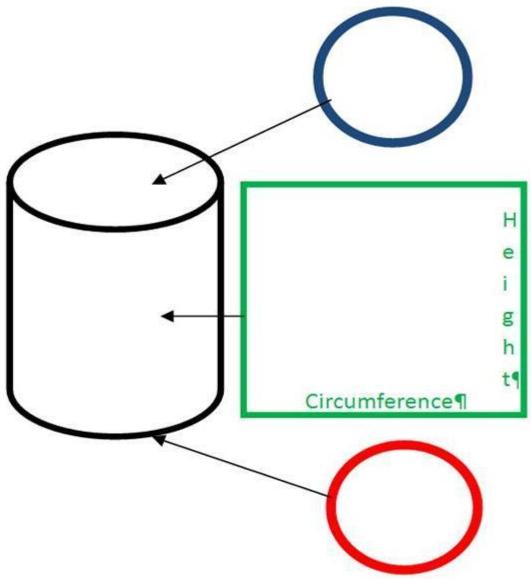
Scaffold:
First draw a picture!



Height: 1
Diameter: 6

We must calculte the Surface Area:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = Pi x r ^{2} + Pi x r^2 + 2 x Pi x r x h

The Base Area is a circle
The Top Area is a circle
The Side Area is calculated by multiplying the circumference (distance around a circle) by the height

We need the Radius, but we are only given the Diameter. We can solve for the Radius:

$$r = \frac{d}{2}$$

$r = \frac{6}{2} = 3$ **We can use it in the Surface Area formula.**

SA = 3.14 x 3^2 + 3.14 x 3^2 + 2 x 3.14 x 3 x 1 **Substitute Values**

SA = 28.26 + 28.26 + 18.84 **Simplify**

SA = 75.36 **Simplify**

The Surface Area of the cylinder is 75.36 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68881

WITH VARIABLES

Radius = %v{radius} inches
Side Surface Area = %v{side} inches

What is the Surface Area of the Cylinder shown below? (square inches)

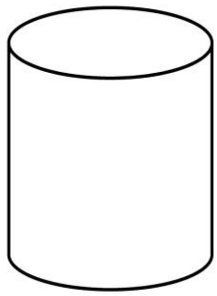


Image not to scale.

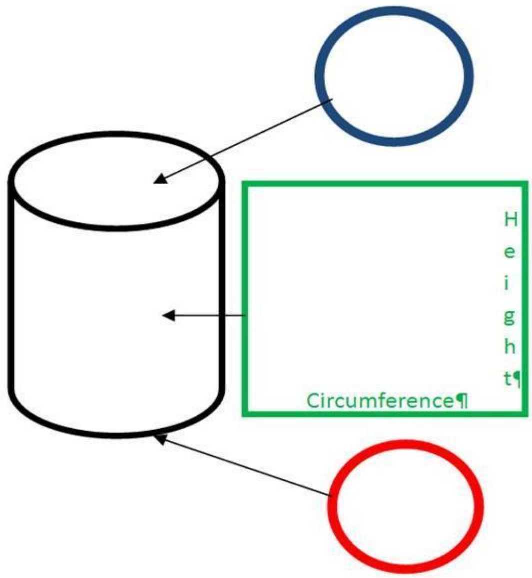
Use 3.14 for ∏.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}
✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = Pi x r ^{2} + Pi x r^{2} + A_{Side}

The Base Area is a circle
The Top Area is a circle
The Side Area is **given in the problem statement**

SA = 3.14 x %v{radius}^{2} + 3.14 x %v{radius}^{2} + %v{side} **Substitute Values**

SA = %v{sa} **Simplify**

The Surface Area of the cylinder is %v{sa} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90864

Radius = 2 inches
Side Surface Area = 25.12 inches

What is the Surface Area of the Cylinder shown below? (square inches)

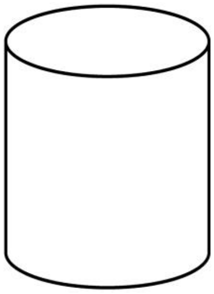


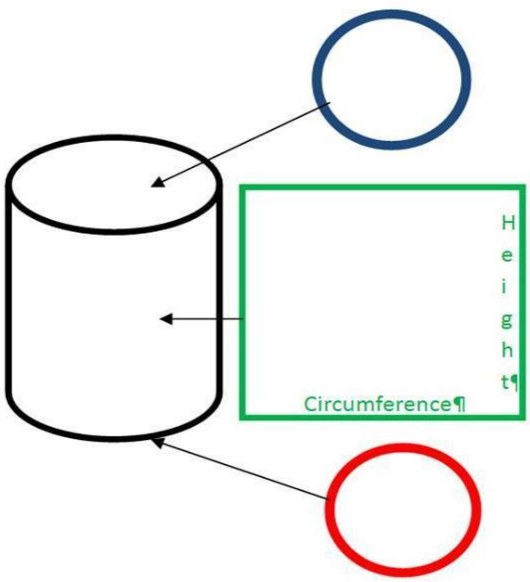
Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

Algebra:
✓ 50.24
✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = Pi x r^2 + Pi x r^2 + A_{Side}

The Base Area is a circle
The Top Area is a circle
The Side Area is **given in the problem statement**

SA = $3.14 \text{ x } 2^2 + 3.14 \text{ x } 2^2 + 25.12$ **Substitute Values**

SA = 50.24 **Simplify**

The Surface Area of the cylinder is 50.24 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68883

WITH VARIABLES

Surface Area = %v{sa} square inches
Radius = %v{radius} inches

What is the lateral surface area of the cylinder shown below? (square inches)

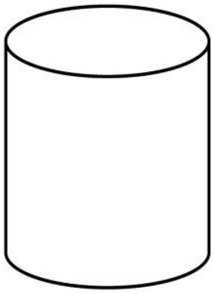


Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

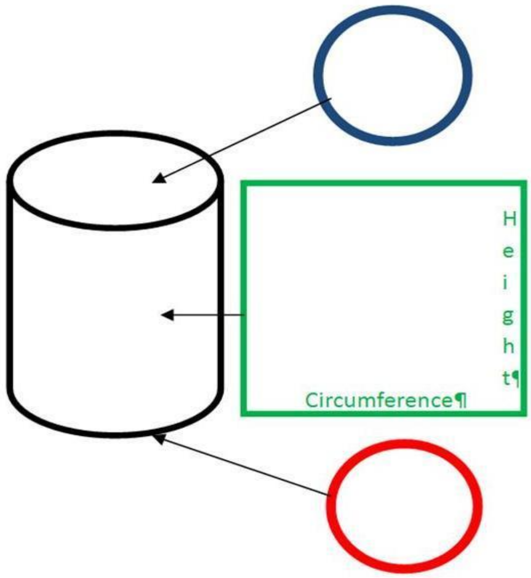
Algebra:

✓ %v{answer}

✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = Pi x r ^{2} + Pi x r^2 + A_{side}

The Base Area is a circle
The Top Area is a circle
We need to find the side area for this question.

%v{sa} = 3.14 x %v{radius}^{2} + 3.14 x %v{radius}^{2} + Side Area **Substitute Values**

%v{sa} = %v{base} + %v{base} + Side Area **Simplify**

%v{sa} = %v{base2} + Side Area **Simplify**

%v{aside} = Side Area **Subtract %v{base2} from both sides**

The lateral surface area (side area) of the cylinder is %v{answer} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90874

Surface Area = 541 square inches
Radius = 5 inches

What is the lateral surface area of the cylinder shown below? (square inches)

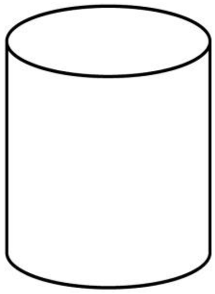


Image not to scale.

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

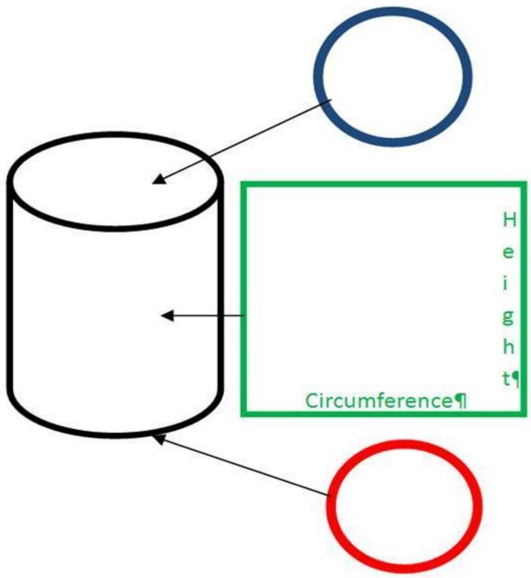
Algebra:

✓ 384

✗ 0

Scaffold:

SA = $A_{Base} + A_{Top} + A_{Side}$



SA = $\text{Pi} \times r^2 + \text{Pi} \times r^2 + A_{side}$

The Base Area is a circle
The Top Area is a circle
We need to find the side area for this question.

$541 = 3.14 \times 5^2 + 3.14 \times 5^2 + \text{Side Area}$ **Substitute Values**

$541 = 78.5 + 78.5 + \text{Side Area}$ **Simplify**

$541 = 157 + \text{Side Area}$ **Simplify**

$384 = \text{Side Area}$ **Subtract 157 from both sides**

The lateral surface area (side area) of the cylinder is 384 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68886

WITH VARIABLES

%v{name} wants to build a %v{type} storage tank that is cylinder-shaped and made of aluminum. The total surface area of the tank is %v{sa} square feet. The lateral surface area is %v{aside} square feet. What is the surface area of the circular top part of the tank?

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

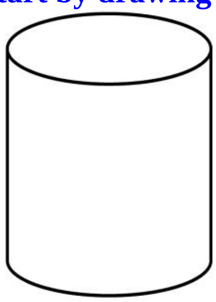
Algebra:

✓ %v{answer}

✗ 0

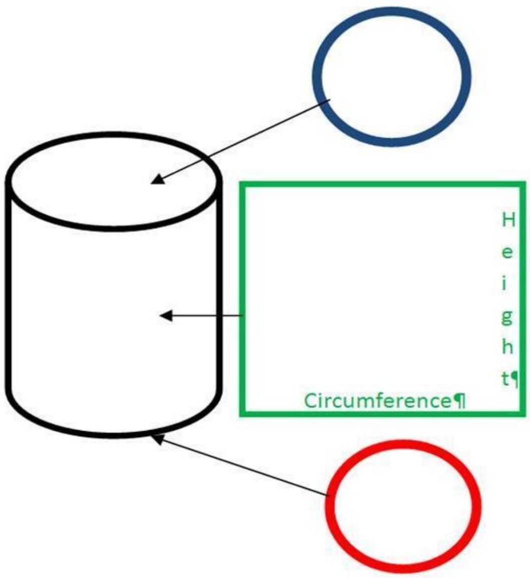
Scaffold:

Start by drawing a picture!



Total Surface Area = %v{sa} square feet
Side Surface Area = %v{aside} square feet

$$SA = A_{Base} + A_{Top} + A_{Side}$$



The Base Area is a circle
The Top Area is a circle
The Side Area is given to be %v{aside} square feet

Because the tank is a cylider, we know that the Base Area is equal to the Top Area.

$SA = (2 \times A_{Top}) + A_{Side}$

%v{sa} = 2 x A_{top}+ %v{aside} **Substitute Values**

%v{base2} = 2 x A_{top} **Subtract %v{aside} from both sides**

%v{base} = A_{top} **Divide both sides by 2**

The area of the top part of the cylinder tank is %v{answer} square inches
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90884

Sam wants to build a Water storage tank that is cylinder-shaped and made of aluminum. The total surface area of the tank is 744 square feet. The lateral surface area is 718.88 square feet. What is the surface area of the circular top part of the tank?

Use 3.14 for ∏.
If there is not enough information to solve, type 0.

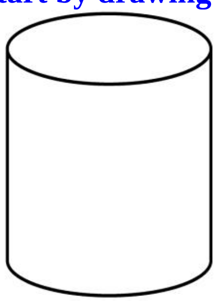
Algebra:

✓ 12.56

✗ 0

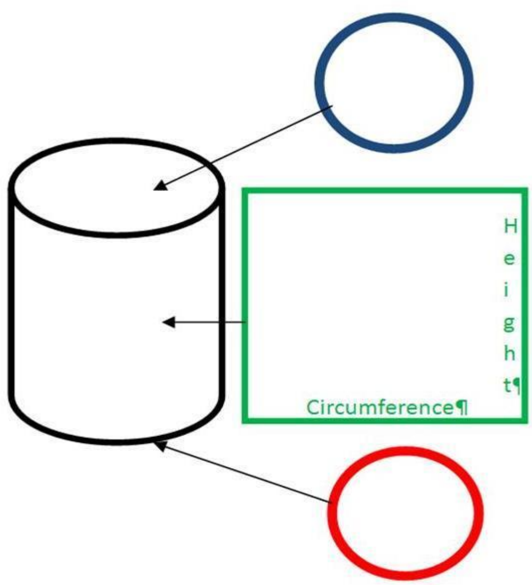
Scaffold:

Start by drawing a picture!



Total Surface Area = 744 square feet
Side Surface Area = 718.88 square feet

$SA = A_{Base} + A_{Top} + A_{Side}$



The Base Area is a circle

The Top Area is a circle
The Side Area is given to be 718.88 square feet

Because the tank is a cylider, we know that the Base Area is equal to the Top Area.

$SA = (2 \times A_{Top}) + A_{Side}$

$744 = 2 \times A_{top} + 718.88$ **Substitute Values**

$25.12 = 2 \times A_{top}$ **Subtract 718.88 from both sides**

$12.56 = A_{top}$ **Divide both sides by 2**

The area of the top part of the cylinder tank is 12.56 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

SURFACE AREA OF PRISMS

TEMPLATE # 68920

WITH VARIABLES

Base Area: %v{base} square inches
Lateral Surface Area: %v{sides} square inches

What is the Surface Area of the hexagonal prism shown below? (in square inches)

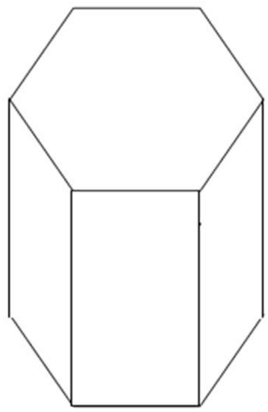


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Remember **Lateral Surface Area** is the Area of Sides

Surface Area = (2 x Base Area) + Area of Sides **Base Area =Top Area**

Surface Area = (2 x %v{base}) + %v{sides} **Substitute Values**

Surface Area = %v{base2} + %v{sides} **Simplify**

Surface Area = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #90894

Base Area: 19 square inches

Lateral Surface Area: 220 square inches

What is the Surface Area of the hexagonal prism shown below? (in square inches)

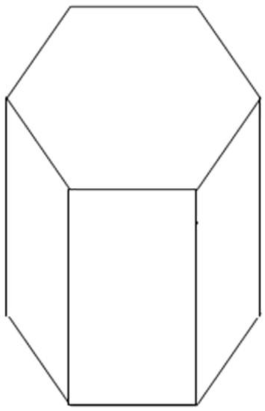


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ 258

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Remember **Lateral Surface Area** is the Area of Sides

Surface Area = (2 x Base Area) + Area of Sides **Base Area =Top Area**

Surface Area = (2 x 19) + 220 **Substitute Values**

Surface Area = 38 + 220 **Simplify**

Surface Area = 258 **Simplify**

The surface area of the prism is 258 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68947

WITH VARIABLES

Top Area: %v{base} square inches
Lateral Surface Area: %v{sides} square inches

What is the Surface Area of the hexagonal prism shown below? (in square inches)

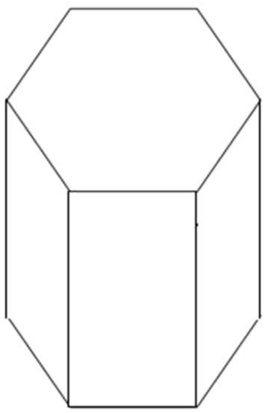


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Remember **Lateral Surface Area** is the Area of Sides

Surface Area = (2 x Top Area) + Area of Sides **Base Area = Top Area**

Surface Area = (2 x %v{base}) + %v{sides} **Substitute Values**

Surface Area = %v{base2} + %v{sides} **Simplify**

Surface Area = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90904

Top Area: 17 square inches
Lateral Surface Area: 432 square inches

What is the Surface Area of the hexagonal prism shown below? (in square inches)

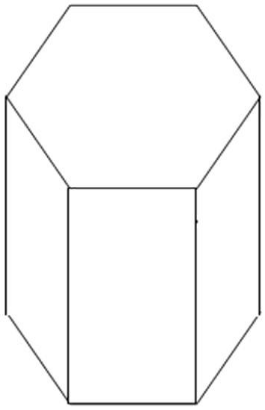


image not to scale

If there is not enough information to solve type 0.

Algebra:
✓ 466
✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Remember **Lateral Surface Area** is the Area of Sides

Surface Area = (2 x Top Area) + Area of Sides **Base Area = Top Area**

Surface Area = (2 x 17) + 432 **Substitute Values**

Surface Area = 34 + 432 **Simplify**

Surface Area = 466 **Simplify**

The surface area of the prism is 466 square inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68952

WITH VARIABLES

Top Area: %v{base} square inches
Top Perimeter: %v{perimeter} inches
Height: %v{height} inches

What is the Surface Area of the 12-sided prism shown below? (in square inches)

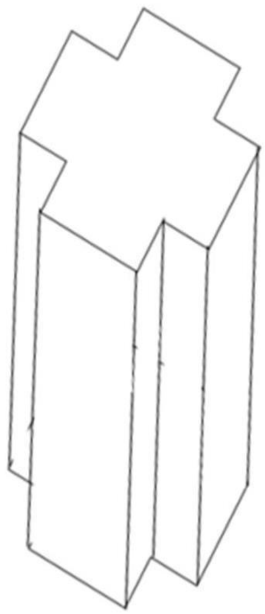


image not to scale

If there is not enough information to solve type 0.

Algebra:

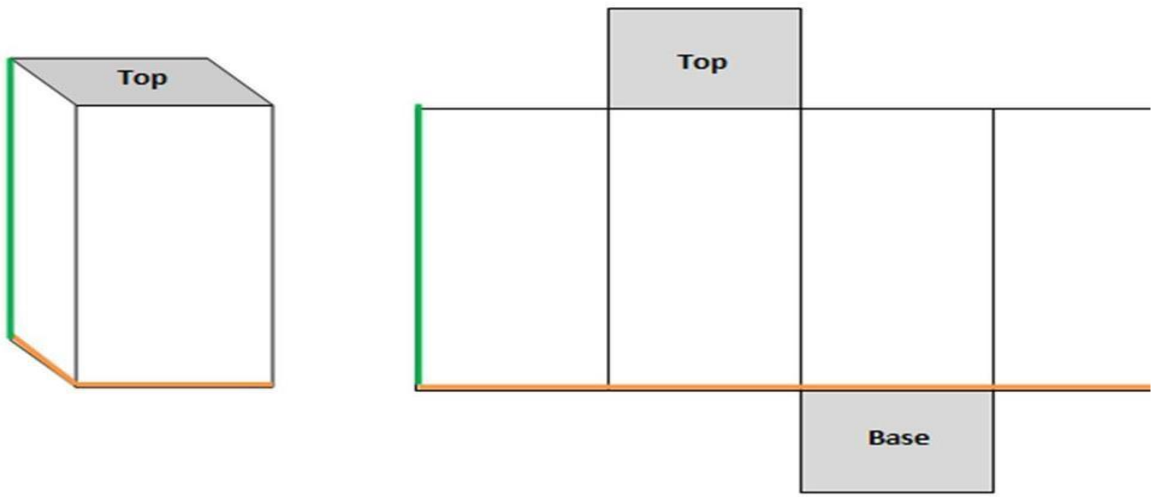
✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Because we are given the perimeter and height we can solve for the surface area of the sides:



A cardboard box is a rectangular prism. If the box is unfolded it is easier to understand the area formula. The green line represents the height of the box and the orange line is the perimeter. Multiplying the height by the perimeter, gives us the **area of all of the sides**. Then we need to add the **base area** and the **top area**. The **base area** and **top area** are equal so we can combine them into one term: **2 x Base** or **2 x Top.**

Surface Area = (2 x Base Area) + (perimeter x height)

Surface Area = (2 x Top Area) + Area of Sides **Base Area = Top Area**

We know the total area of the sides is Perimeter x Height

Surface Area = (2 x Top Area) + **(** perimeter x height **)**

Surface Area = (2 x %v{base}) + (%v{ perimeter} x %v{height}) **Substitute Values**

Surface Area = %v{base2} + %v{sides} **Simplify**

Surface Area = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90914

Top Area: 20 square inches
Top Perimeter: 24 inches
Height: 13 inches

What is the Surface Area of the 12-sided prism shown below? (in square inches)

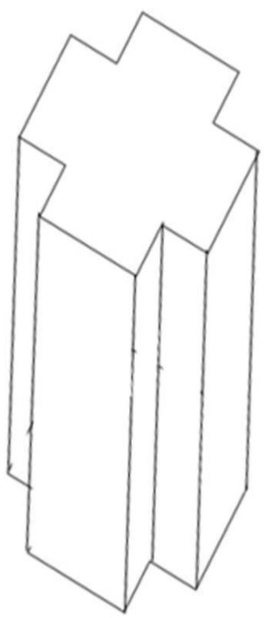


image not to scale

If there is not enough information to solve type 0.

Algebra:

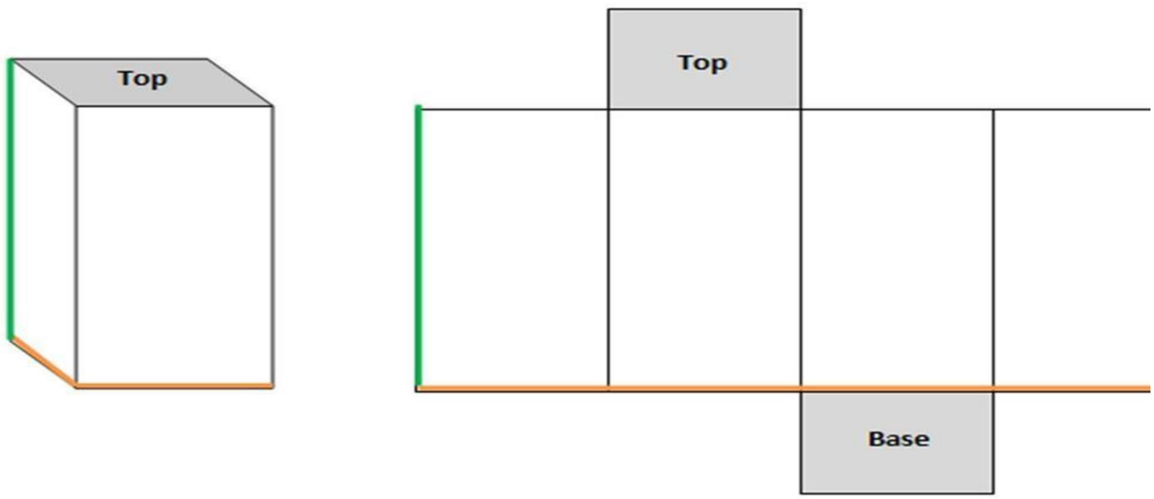
352

0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Because we are given the perimeter and height we can solve for the surface area of the sides:



A cardboard box is a rectangular prism. If the box is unfolded it is easier to understand the area formula. The green line represents the **height** of the box and the orange line is the **perimeter**. Multiplying the **height** by the **perimeter**, gives us the **area of all of the sides**. Then we need to add the **base area** and the **top area**. The **base area** and **top area** are equal so we can combine them into one term: **2 x Base** or **2 x Top.**

Surface Area = (2 x Base Area) + (perimeter x height)

Surface Area = (2 x Top Area) + Area of Sides **Base Area = Top Area**

We know the total area of the sides is Perimeter x Height

Surface Area = (2 x Top Area) + **(** perimeter x height **)**

Surface Area = (2 x 20) + (24 x 13) **Substitute Values**

Surface Area = 40 + 312 **Simplify**

Surface Area = 352 **Simplify**

The surface area of the prism is 352 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68953

WITH VARIABLES

Base Area: %v{base} square inches
Base Perimeter: %v{perimeter} inches
Height: %v{height} inches

What is the Surface Area of the 12-sided prism shown below? (in square inches)

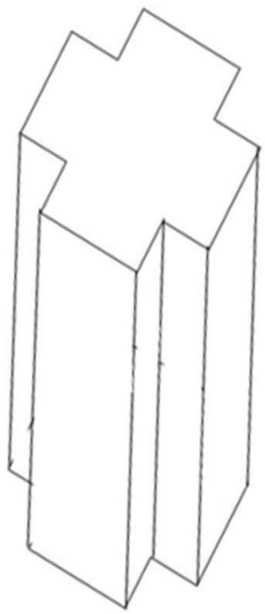


image not to scale

If there is not enough information to solve type 0.

Algebra:

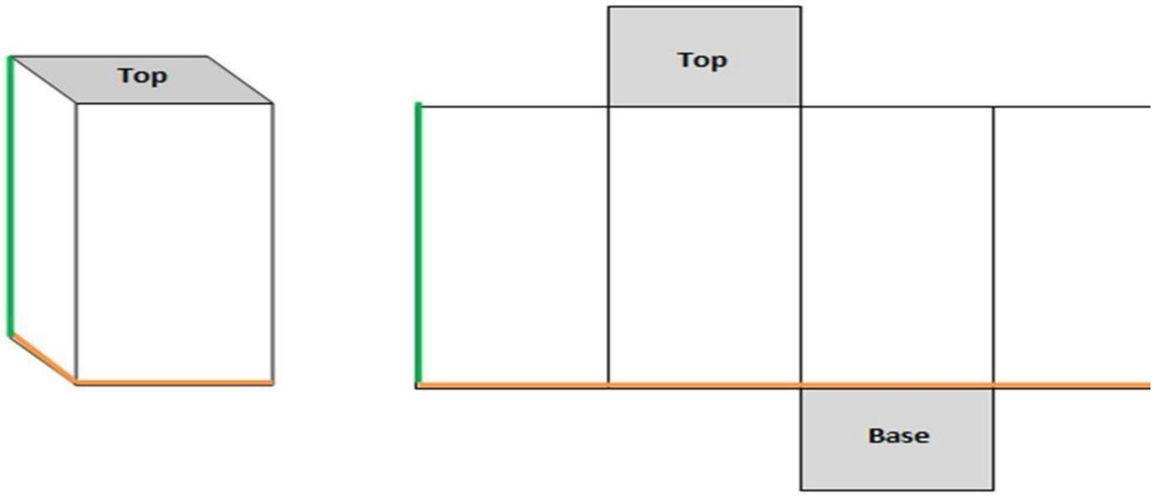
✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Because we are given the perimeter and height we can solve for the surface area of the sides:



A cardboard box is a rectangular prism. If the box is unfolded it is easier to understand the area formula. The green line represents the **height** of the box and the orange line is the **perimeter**. Multiplying the **height** by the **perimeter**, gives us the **area of all of the sides**. Then we need to add the **base area** and the **top area**. The **base area** and **top area** are equal so we can combine them into one term: **2 x Base** or **2 x Top.**

Surface Area = (2 x Base Area) + (perimeter x height)

Surface Area = (2 x Base Area) + Area of Sides **Base Area = Top Area**

We know the total area of the sides is Perimeter x Height

Surface Area = (2 x Top Area) + **(** perimeter x height **)**

Surface Area = (2 x %v{base}) + (%v{ perimeter} x %v{height}) **Substitute Values**

Surface Area = %v{base2} + %v{sides} **Simplify**

Surface Area = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90924

Base Area: 11 square inches
Base Perimeter: 28 inches
Height: 11 inches

What is the Surface Area of the 12-sided prism shown below? (in square inches)

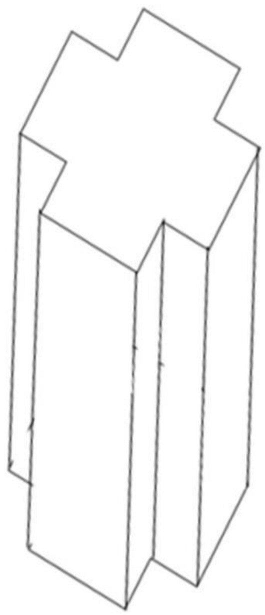


image not to scale

If there is not enough information to solve type 0.

Algebra:

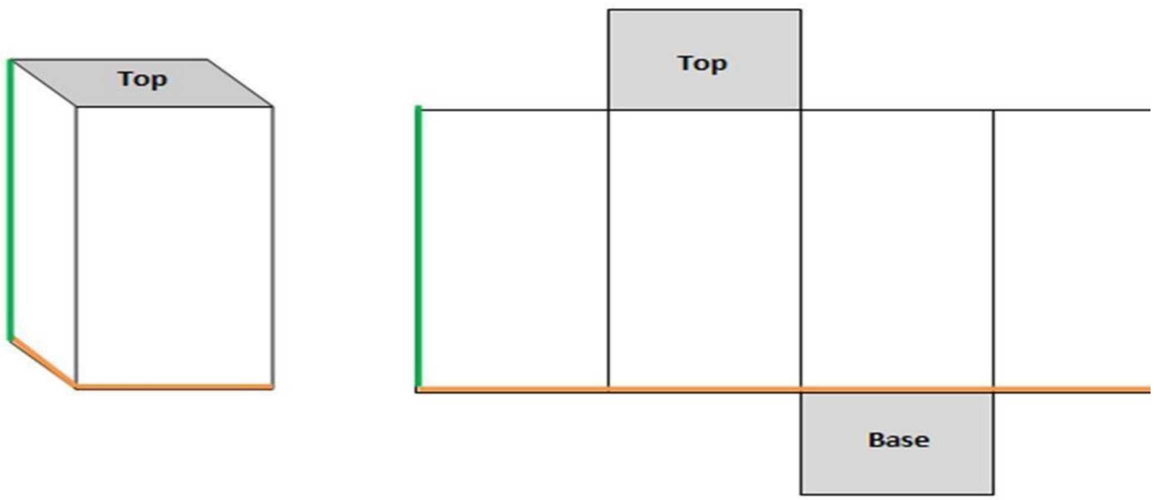
✓ 330

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Because we are given the perimeter and height we can solve for the surface area of the sides:



A cardboard box is a rectangular prism. If the box is unfolded it is easier to understand the area formula. The green line represents the **height** of the box and the orange line is the **perimeter**. Multiplying the **height** by the **perimeter**, gives us the **area of all of the sides**. Then we need to add the **base area** and the **top area**. The **base area** and **top area** are equal so we can combine them into one term: **2 x Base** or **2 x Top.**

Surface Area = (2 x Base Area) + (perimeter x height)

Surface Area = (2 x Base Area) + Area of Sides

Base Area = Top Area

We know the total area of the sides is Perimeter x Height

Surface Area = (2 x Top Area) + (perimeter x height)

Surface Area = (2 x 11) + (28 x 11) **Substitute Values**

Surface Area = 22 + 308 **Simplify**

Surface Area = 330 **Simplify**

The surface area of the prism is 330 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68954

WITH VARIABLES

Base Area: %v{base} square inches
Total Surface Area: %v{sa} square inches

What is the Lateral Surface Area of the 5-sided prism shown below? (in square inches)

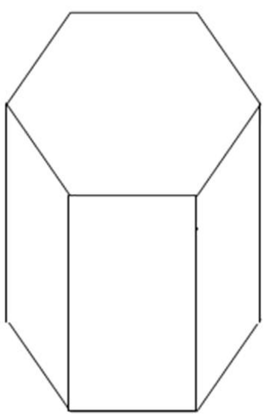


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Lateral Surface Area is the Area of the Sides

Surface Area = Base Area + Top Area + Lateral Surface Area

Surface Area = (2 x Base Area) + Lateral Surface Area **Base Area = Top Area**

%v{sa} = (2 x %v{base}) + Lateral Surface Area **Substitute Values**

%v{sa} = %v{base2} + Lateral Surface Area **Simplify**

%v{sa} - %v{base2} = Lateral Surface Area **Subtract %v{base2} from both sides**

%v{sides} = Lateral Surface Area **Simplify**

The lateral surface area of the prism is %v{sides} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #90934

Base Area: 22 square inches
Total Surface Area: 254 square inches

What is the Lateral Surface Area of the 5-sided prism shown below? (in square inches)

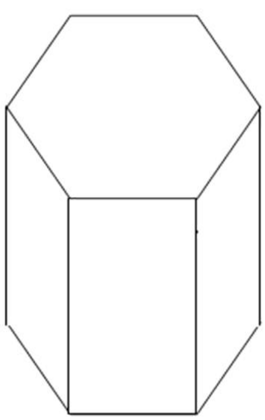


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ 210

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Lateral Surface Area is the Area of the Sides

Surface Area = Base Area + Top Area + Lateral Surface Area

Surface Area = (2 x Base Area) + Lateral Surface Area **Base Area = Top Area**

254 = (2 x 22) + Lateral Surface Area **Substitute Values**

254 = 44 + Lateral Surface Area **Simplify**

254 - 44 = Lateral Surface Area **Subtract 44 from both sides**

210 = Lateral Surface Area **Simplify**

The lateral surface area of the prism is 210 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68955

WITH VARIABLES

Top Area: %v{base} square inches
Total Surface Area: %v{sa} square inches

What is the Lateral Surface Area of the 5-sided prism shown below? (in square inches)

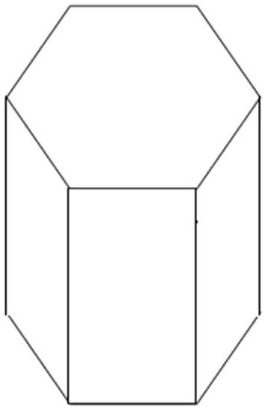


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Lateral Surface Area is the Area of the Sides

Surface Area = Base Area + Top Area + Lateral Surface Area

Surface Area = (2 x Top Area) + Lateral Surface Area **Base Area = Top Area**

%v{sa} = (2 x %v{base}) + Lateral Surface Area **Substitute Values**

%v{sa} = %v{base2} + Lateral Surface Area **Simplify**

%v{sa} - %v{base2} = Lateral Surface Area **Subtract %v{base2} from both sides**

%v{sides} = Lateral Surface Area **Simplify**

The lateral surface area of the prism is %v{sides} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90944

Top Area: 15 square inches
Total Surface Area: 216 square inches

What is the Lateral Surface Area of the 5-sided prism shown below? (in square inches)

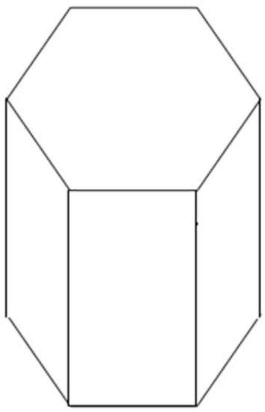


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ 186

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Lateral Surface Area is the Area of the Sides

Surface Area = Base Area + Top Area + Lateral Surface Area

Surface Area = (2 x Top Area) + Lateral Surface Area **Base Area = Top Area**

216 = (2 x 15) + Lateral Surface Area **Substitute Values**

216 = 30 + Lateral Surface Area **Simplify**

216 - 30 = Lateral Surface Area **Subtract 30 from both sides**

186 = Lateral Surface Area **Simplify**

The lateral surface area of the prism is 186 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 68956

WITH VARIABLES

Top Area: 15 square inches
Total Surface Area: 216 square inches

What is the Lateral Surface Area of the 5-sided prism shown below? (in square inches)

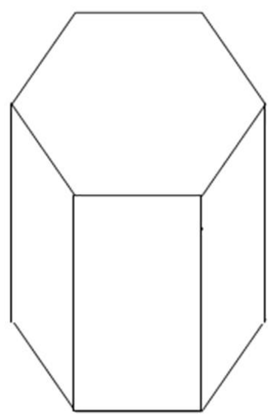


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ 186

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Lateral Surface Area is the Area of the Sides

Surface Area = Base Area + Top Area + Lateral Surface Area

Surface Area = (2 x Top Area) + Lateral Surface Area **Base Area = Top Area**

216 = (2 x 15) + Lateral Surface Area **Substitute Values**

216 = 30 + Lateral Surface Area **Simplify**

216 - 30 = Lateral Surface Area **Subtract 30 from both sides**

186 = Lateral Surface Area **Simplify**

The lateral surface area of the prism is 186 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90954

Height: 7 inches
Base Perimeter: 49 inches
Lateral Surface Area: 343 square inches **this is the total surface area of the sides

What is the Surface Area of the triangular prism shown below? (in square inches)

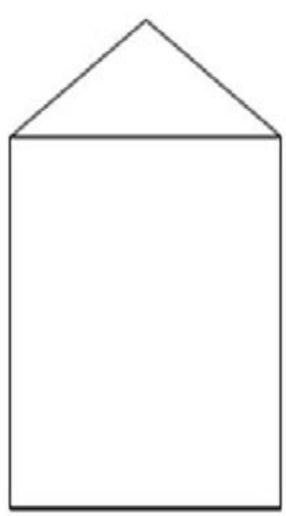


image not to scale

If there is not enough information to solve type 0.

Algebra:

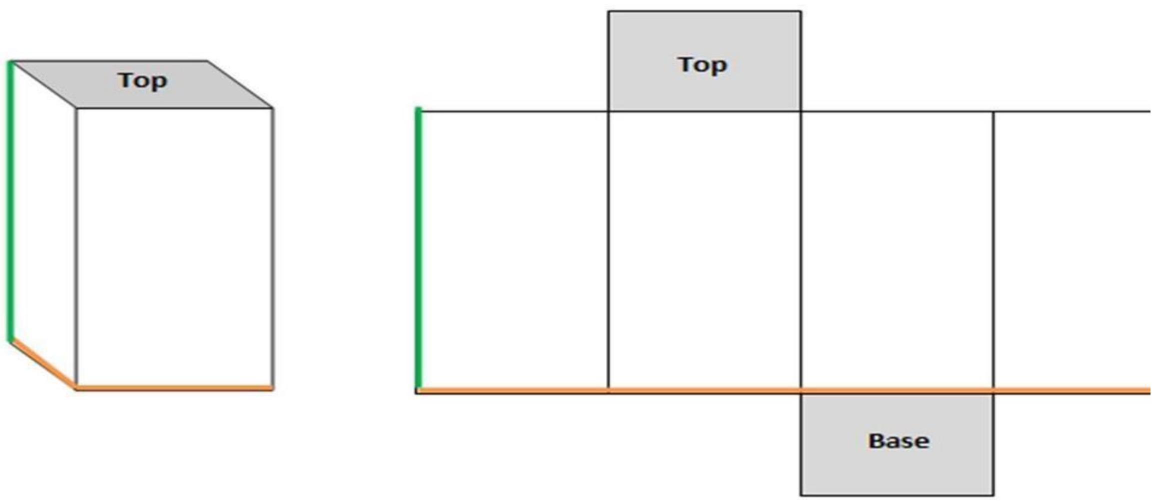
✓ 0

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

We are given the lateral (side) surface area, the height and the perimeter. Can we find the Surface Area:



A cardboard box is a rectangular prism. If the box is unfolded it is easier to understand the area formula. The green line represents the **height** of the box and the orange line is the **perimeter**. Multiplying the **height** by the **perimeter**, gives us the **area of all of the sides**. Then we need to add the **base area** and the **top area**. The **base area** and **top area** are equal so we can combine them into one term: **2 x Base** or **2 x Top.**

Surface Area = (2 x Base Area) + (perimeter x height)

There is no way to find the base area of this prism with the given information. Therefore, the problem can not be solved.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 70985

WITH VARIABLES

Base Area: %v{base} square inches
Lateral Surface Area: %v{sides} square inches

What is the Surface Area of the triangular prism shown below? (in square inches)

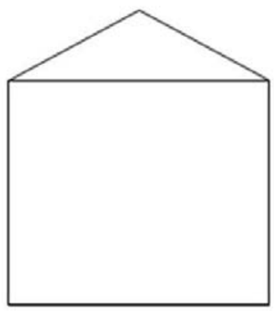


image not to scale

If there is not enough information to solve type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Top Area + Area of Sides

Remember **Lateral Surface Area** is the Area of Sides

Surface Area = (2 x Base Area) + Area of Sides **Base Area =Top Area**

Surface Area = (2 x %v{base}) + %v{sides} **Substitute Values**

Surface Area = %v{base2} + %v{sides} **Simplify**

Surface Area = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90964

Base Area: 14 square inches
Lateral Surface Area: 559 square inches

What is the Surface Area of the triangular prism shown below? (in square inches)

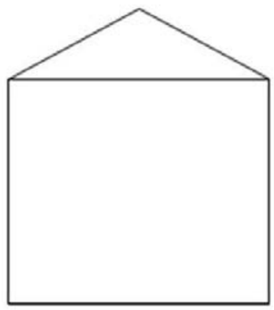


image not to scale

If there is not enough information to solve type 0.

Algebra:
✓ 587
✗ 0

Scaffold:
Surface Area = Base Area + Top Area + Area of Sides

Remember **Lateral Surface Area** is the Area of Sides

Surface Area = (2 x Base Area) + Area of Sides **Base Area =Top Area**

Surface Area = (2 x 14) + 559 **Substitute Values**

Surface Area = 28 + 559 **Simplify**

Surface Area = 587 **Simplify**

The surface area of the prism is 587 square inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

SURFACE AREA OF PYRAMIDS

TEMPLATE # 69137

WITH VARIABLES

Area of One Side: %v{side}
Area of Base: %v{base}

What is the Surface Area of the Square pyramid shown below? (square inches)

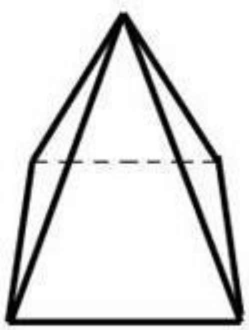


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Surface Area = Base Area + [Area of Side x Number of Sides]

Since this is a square pyramid, there are 4 sides with equal areas.

Surface Area = %v{base} + [%v{side} x 4] **Substitute Values**

Surface Area = %v{answer} **Simplify**

The Surface Area of the Square Pyramid is %v{answer} square inches

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90974

Area of One Side: 30
Area of Base: 49

What is the Surface Area of the Square pyramid shown below? (square inches)

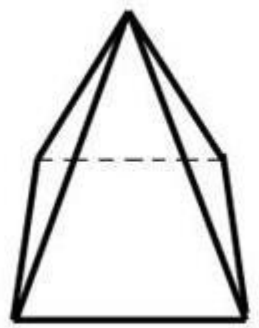


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:
✓ 169
✗ 0

Scaffold:
Surface Area = Base Area + Area of Sides

Surface Area = Base Area + [Area of Side x Number of Sides]

Since this is a square pyramid, there are 4 sides with equal areas.

Surface Area = 49 + [30 x 4] **Substitute Values**

Surface Area = 169 **Simplify**

The Surface Area of the Square Pyramid is 169 square inches
Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #69138

WITH VARIABLES

Area of One Side: %v{side}
Area of Base: %v{base}

What is the Surface Area of the pyramid with an equilateral triangle for a base shown below? (square inches)

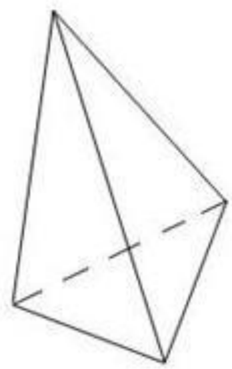


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Surface Area = Base Area + [Area of Side x Number of Sides]

Since this is apyramid with an equilateral triangle for a base, there are 3 sides with equal areas.

Surface Area = %v{base} + [%v{side} x 3] **Substitute Values**

Surface Area = %v{answer} **Simplify**

The Surface Area of the Pyramid is %v{answer} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90984

Area of One Side: 28
Area of Base: 57

What is the Surface Area of the pyramid with an equilateral triangle for a base shown below? (square inches)

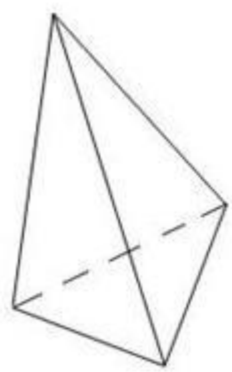


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ 141

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Surface Area = Base Area + [Area of Side x Number of Sides]

Since this is apyramid with an equilateral triangle for a base, there are 3 sides with equal areas.

Surface Area = 57 + [28 x 3] **Substitute Values**

Surface Area = 141 **Simplify**

The Surface Area of the Pyramid is 141 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69139

WITH VARIABLES

Area of One Side: %v{side}
Area of Base: %v{base}

What is the Surface Area of the Non Square Recatangular Pyramid shown below? (square inches)

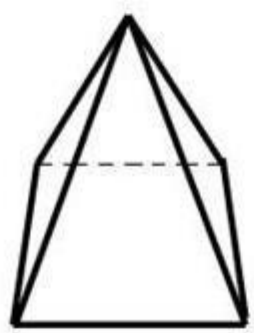


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:
✓ %v{answer}

Scaffold:
Surface Area = Base Area + Area of Sides

The base of the pyramid is a rectangle, which means that the area of each side is not the same (unless the base is also a square). We are only given the area of one side and cannot find the total area of all four sides, so there is **not enough information to solve.**

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 90994

Area of One Side: 19
Area of Base: 67

What is the Surface Area of the Non Square Recatangular Pyramid shown below? (square inches)

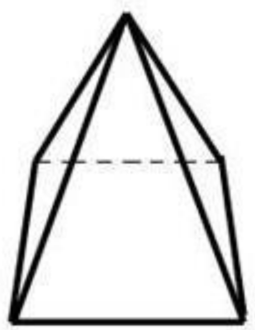


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:
✓ 0

Scaffold:
Surface Area = Base Area + Area of Sides

The base of the pyramid is a rectangle, which means that the area of each side is not the same (unless the base is also a square). We are only given the area of one side and cannot find the total area of all four sides, so there is **not enough information to solve.**

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69140

WITH VARIABLES

Total Area of Sides: %v{sides}
Area of Base: %v{base}

What is the Surface Area of the Recatangular Pyramid shown below? (square inches)

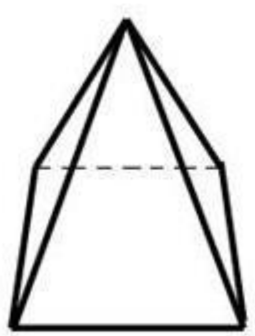


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:
✓ %v{answer}
✗ 0

Scaffold:
Surface Area = Base Area + Area of Sides

Surface Area = %v{base} + %v{sides} **Substitute Values**

Surface Area = %v{answer} **Simplify**

The Surface Area of the Square Pyramid is %v{answer} square inches

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91004

Total Area of Sides: 76
Area of Base: 60

What is the Surface Area of the Recatangular Pyramid shown below? (square inches)

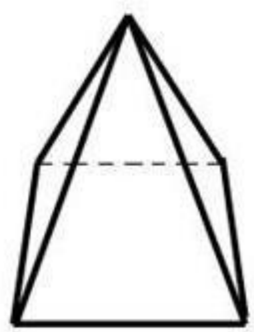


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:
✓ 136

✘ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Surface Area = 60 + 76 **Substitute Values**

Surface Area = 136 **Simplify**

The Surface Area of the Square Pyramid is 136 square inches

Multiple choice:

✔ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69141

WITH VARIABLES

Total Area of Sides: %v{sides}
Total Surface Area: %v{sa}

What is the Base Area of the Recatangular Pyramid shown below? (square inches)

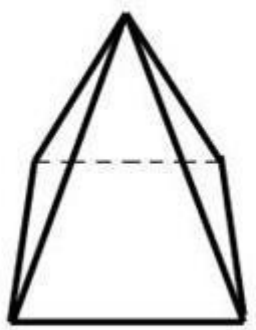


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✔ %v{answer}

✘ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Surface Area - Total Side Area = Base Area **Subtract Total Side Area from both sides**

%v{sa} - %v{sides} = Base Area **Substitute Values**

%v{base} = Base Area **Simplify**

The BaseArea of the Pyramid is %v{answer} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91014

Total Area of Sides: 120
Total Surface Area: 187

What is the Base Area of the Recatangular Pyramid shown below? (square inches)

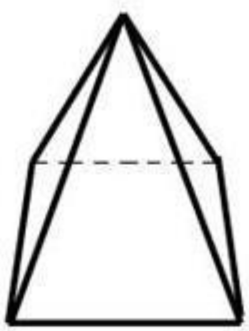


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ 67

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Surface Area - Total Side Area = Base Area **Subtract Total Side Area from both sides**

187 - 120 = Base Area **Substitute Values**

67 = Base Area **Simplify**

The BaseArea of the Pyramid is 67 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69142

WITH VARIABLES

Total Area of Sides: %v{sides}
Total Surface Area: %v{sa}
Note: The triangle is not an equilateral triangle.

What is the Base Area of the Triangular Pyramid shown below? (square inches)

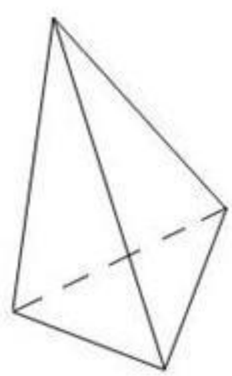


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

The fact that the Triangle is not equilateral is extra information. It is not necessary to solve the problem because you are given the total surface area of the sides.

Surface Area - Total Side Area = Base Area **Subtract Total Side Area from both sides**

%v{sa} - %v{sides} = Base Area **Substitute Values**

%v{base} = Base Area **Simplify**

The BaseArea of the Pyramid is %v{answer} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91024

Total Area of Sides: 84
Total Surface Area: 147
Note: The triangle is not an equilateral triangle.

What is the Base Area of the Triangular Pyramid shown below? (square inches)

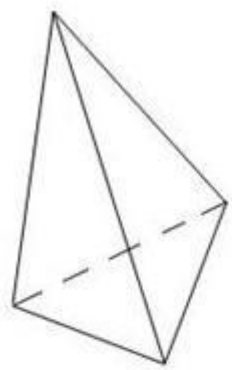


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ 63

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

The fact that the Triangle is not equilateral is extra information. It is not necessary to solve the problem because you are given the total surface area of the sides.

Surface Area - Total Side Area = Base Area **Subtract Total Side Area from both sides**

147 - 84 = Base Area **Substitute Values**

63 = Base Area **Simplify**

The BaseArea of the Pyramid is 63 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69143

WITH VARIABLES

Base Surface Area: %v{base}

Total Surface Area: %v{sa}
Note: The triangle base is an equilateral triangle.

What is the Surface Area of **ONE SIDE** of the Triangular Pyramid shown below? (square inches)

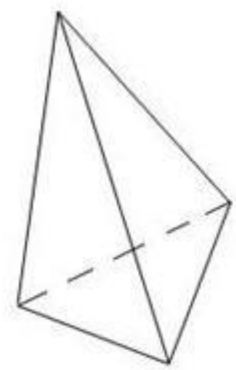


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Because the base of the pyramid is an equilateral triangle, all 3 sides have an equal area, so the problem can be solved.

%v{sa} = %v{base} + Area of Sides

%v{sides} = Area of Sides **Subtract %v{base} from both sides**

We know the total Surface Area of the Sides and the Number of sides:

Area of Sides = Number of Sides x Area of ONE Side

%v{sides} = 3 x Area of One Side **Substitute Values**

%v{side} = Area of One Side **Divide Both Sides By 3**

The Surface Area of Each Side is %v{side} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91034

Base Surface Area: 53
Total Surface Area: 137
Note: The triangle base is an equilateral triangle.

What is the Surface Area of **ONE SIDE** of the Triangular Pyramid shown below? (square inches)

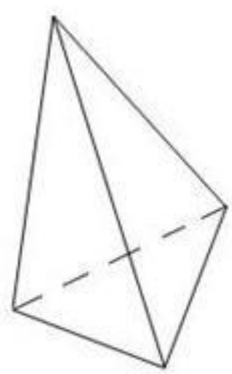


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ 28

✗ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Because the base of the pyramid is an equilateral triangle, all 3 sides have an equal area, so the problem can be solved.

137 = 53 + Area of Sides
84 = Area of Sides **Subtract 53 from both sides**

We know the total Surface Area of the Sides and the Number of sides:

Area of Sides = Number of Sides x Area of ONE Side

84 = 3 x Area of One Side **Substitute Values**

28 = Area of One Side **Divide Both Sides By 3**

The Surface Area of Each Side is 28 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69144

WITH VARIABLES

Base Surface Area: %v{base}
Total Surface Area: %v{sa}
Note: The triangle base is **NOT** an equilateral triangle.

What is the Surface Area of **ONE SIDE** of the Triangular Pyramid shown below? (square inches)

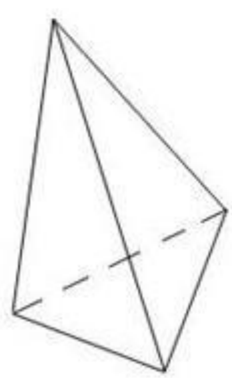


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

Scaffold:

Surface Area = Base Area + Area of Sides

Because the base of the pyramid is not an equilateral triangle, all 3 sides will not have an equal area. There is only sufficient information to find the Total Surface Area of the Sides, but not the Surface Area of each individual side. There is not enough information for the problem to be solved.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91044

Base Surface Area: 53
Total Surface Area: 125
Note: The triangle base is **NOT** an equilateral triangle.

What is the Surface Area of **ONE SIDE** of the Triangular Pyramid shown below? (square inches)

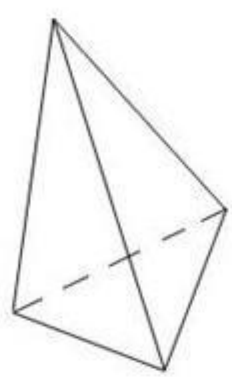


Image not to scale.

If there is not enough information to solve, type 0.

Algebra:

✓ 0

Scaffold:

Surface Area = Base Area + Area of Sides

Because the base of the pyramid is not an equilateral triangle, all 3 sides will not have an equal area. There is only sufficient information to find the Total Surface Area of the Sides, but not the Surface Area of each individual side. There is not enough information for the problem to be solved.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

SURFACE AREA OF RECTANGULAR PRISMS

TEMPLATE # 69145

WITH VARIABLES

Area of Side A (A) = %v{a} square inches
Area of Side B (B) = %v{b} square inches
Area of Side C (C) = %v{c} square inches

What is the Surface Area of the Rectangular Prism shown below? (square inches)

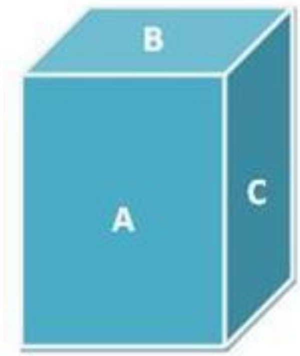


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x C

SA = 2 x %v{a} + 2 x %v{b} + 2 x %v{c} **Substitute Values**

SA = %v{a2} + %v{b2} + %v{c2} **Simplify**

SA = %v{sa} **Simplify**

The surface area of the rectangular prism is %v{sa} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91054

Area of Side A (A) = 24 square inches
Area of Side B (B) = 1 square inches
Area of Side C (C) = 24 square inches

What is the Surface Area of the Rectangular Prism shown below? (square inches)

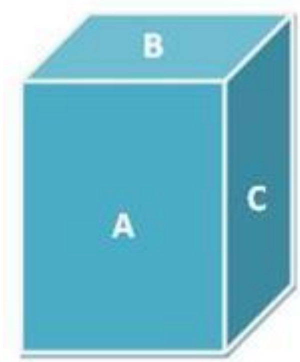


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ 98

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x C

SA = 2 x 24 + 2 x 1 + 2 x 24 **Substitute Values**

SA = 48 + 2 + 48 **Simplify**

SA = 98 **Simplify**

The surface area of the rectangular prism is 98 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69146

WITH VARIABLES

Area of Side A (A) = %v{a} square inches
Area of Side B (B) = %v{b} square inches
Total Surface Area (SA) = %v{sa} square inches

What is the Area of Side C in the Rectangular Prism shown below? (square inches)

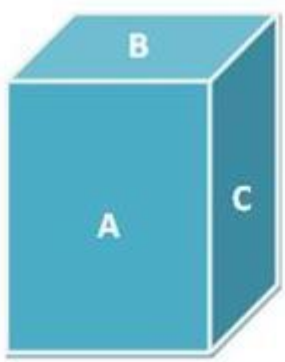


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x C

%v{sa} = 2 x %v{a} + 2 x %v{b} + 2 x C **Substitute Values**

%v{sa} = %v{a2} + %v{b2} + 2 x C **Simplify**

%v{2*c} = 2 x C **Simplify**

%v{c} = C **Divide by 2**

The surface area of side C of the rectangular prism is %v{c} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #91064

Area of Side A (A) = 11 square inches
Area of Side B (B) = 18 square inches
Total Surface Area (SA) = 166 square inches

What is the Area of Side C in the Rectangular Prism shown below? (square inches)

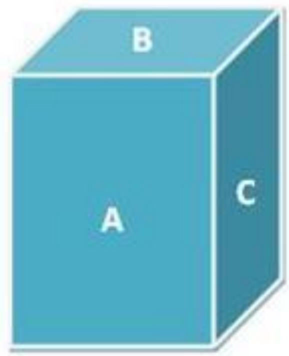


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ 54

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x C

166 = 2 x 11 + 2 x 18 + 2 x C **Substitute Values**

166 = 22 + 36 + 2 x C **Simplify**

108 = 2 x C **Simplify**

54 = C **Divide by 2**

The surface area of side C of the rectangular prism is 54 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #69147

WITH VARIABLES

Area of Side A (A) = %v{a} square inches
Area of Side B (B) = %v{b} square inches
Length of Side C = %v{lc} inches
Total Surface Area (SA) = %v{sa} square inches

What is the Width of Side C in the Rectangular Prism shown below? (inches)

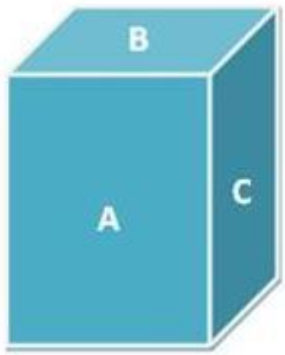


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x **C**

SA = 2 x A + 2 x B + 2 x **(L x W)** **The area of side C is (L x W)**

%v{sa} = 2 x %v{a} + 2 x %v{b} + 2 x **(%v{lc} x W)** **Substitute Values**

%v{sa} = %v{a2} + %v{b2} + %v{lc2} x W **Simplify**

%v{sub} = %v{lc2} x W **Subtract (%v{a2} + %v{b2})**

%v{hc} = W **Divide by %v{lc2}**

The width of side C of the rectangular prism is %v{hc} inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91074

Area of Side A (A) = 28 square inches
Area of Side B (B) = 8 square inches
Length of Side C = 2 inches
Total Surface Area (SA) = 100 square inches

What is the Width of Side C in the Rectangular Prism shown below? (inches)

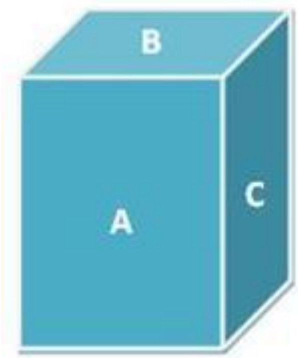


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ 7
✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x **C**

SA = 2 x A + 2 x B + 2 x **(L x W)** **The area of side C is (L x W)**

100 = 2 x 28 + 2 x 8 + 2 x **(2 x W)** **Substitute Values**

100 = 56 + 16 + 4 x W **Simplify**

28 = 4 x W **Subtract (56 + 16)**

7 = W **Divide by 4**

The width of side C of the rectangular prism is 7 inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69148

WITH VARIABLES

Area of Side A (A) = %v{a} square inches
Area of Side B (B) = %v{b} square inches
Width of Side C = %v{lc} inches
Total Surface Area (SA) = %v{sa} square inches

What is the Length of Side C in the Rectangular Prism shown below? (inches)

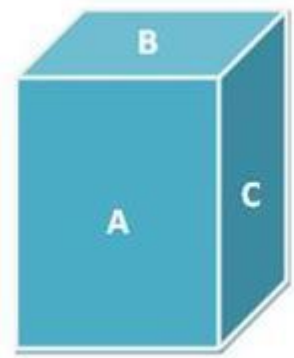


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x **C**

SA = 2 x A + 2 x B + 2 x **(L x W)** **The area of side C is (L x W)**

%v{sa} = 2 x %v{a} + 2 x %v{b} + 2 x **(L x %v{lc})** **Substitute Values**

%v{sa} = %v{a2} + %v{b2} + L x %v{lc2} **Simplify**

%v{sub} = L x %v{lc2} **Subtract (%v{a2} + %v{b2})**

%v{hc} = L **Divide by %v{lc2}**

The length of side C of the rectangular prism is %v{hc} inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #91084

Area of Side A (A) = 9 square inches
Area of Side B (B) = 4 square inches
Width of Side C = 4 inches
Total Surface Area (SA) = 98 square inches

What is the Length of Side C in the Rectangular Prism shown below? (inches)

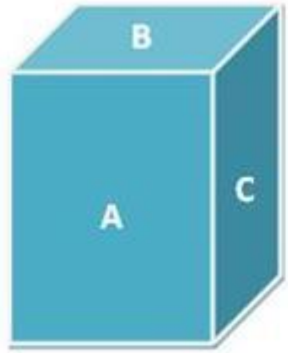


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ 9

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x **C**

SA = 2 x A + 2 x B + 2 x **(L x W)** **The area of side C is (L x W)**

98 = 2 x 9 + 2 x 4 + 2 x **(L x 4)** **Substitute Values**

98 = 18 + 8 + L x 8 **Simplify**

72 = L x 8 **Subtract (18 + 8)**

9 = L **Divide by 8**

The length of side C of the rectangular prism is 9 inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69154

WITH VARIABLES

Area of Side A (A) = %v{a} square inches
Area of Side B (B) = %v{b} square inches
Width of Side C (W) = %v{lc} inches
Length of Side C (L) = %v{hc} inches

What is the Surface Area of the Rectangular Prism shown below? (square inches)

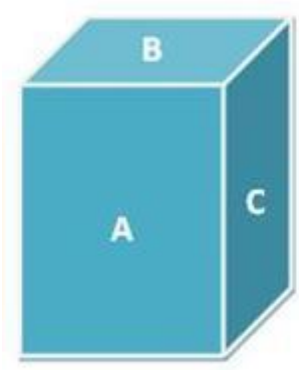


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x **C**

SA = 2 x A + 2 x B + 2 x **(L x W)** **The area of side C is (L x W)**

SA = 2 x %v{a} + 2 x %v{b} + 2 x **(%v{hc} x %v{lc})** **Substitute Values**

SA = %v{a2} + %v{b2} + %v{c2} **Simplify**

SA = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE #91094

Area of Side A (A) = 33 square inches
Area of Side B (B) = 18 square inches
Width of Side C (W) = 4 inches
Length of Side C (L) = 9 inches

What is the Surface Area of the Rectangular Prism shown below? (square inches)

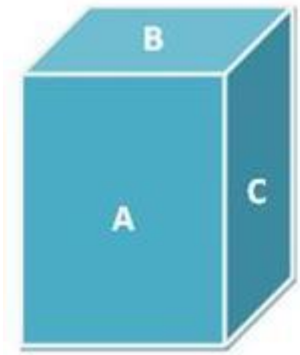


image not to scale

If there is not enough information to solve, type 0.

Algebra:

✓ 174

✗ 0

Scaffold:

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x A + 2 x B + 2 x **C**

SA = 2 x A + 2 x B + 2 x **(L x W)** **The area of side C is (L x W)**

SA = 2 x 33 + 2 x 18 + 2 x **(9 x 4)** **Substitute Values**

SA = 66 + 36 + 72 **Simplify**

SA = 174 **Simplify**

The surface area of the prism is 174 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69155

WITH VARIABLES

A %v{storage} storage tank shaped like a rectangular prism is being built. The dimensions of the base are **%v{l} ft** by **%v{w} ft.** The height of the tank is **%v{h} ft.** What is the total surface area of the tank?
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}
✗ 0

Scaffold:

First draw a picture!

h = %v{h}

w = %v{w}

l = %v{l}

We know that there is a pairs of walls with each of the following dimensions:

A: %v{l} ft by %v{h} ft
B: %v{l} ft by %v{w} ft
C: %v{w} ft by %v{h} ft

Each wall (A, B, and C) has an identical wall across from it (D, E, F)

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x **A** + 2 x **B** + 2 x **C**

The areas of each rectangular side can be found by multiplying the 2 dimensions of that side

SA = 2 x **(l x h)** + 2 x **(l x w)** **+** 2 x **(w x h)**

SA = 2 x **(%v{l} x %v{h})** + 2 x **(%v{l} x %v{w})** **+** 2 x **(%v{w} x %v{h})** **Substitute Values**

SA = 2 x **%v{a}** + 2 x **%v{b}** + **2 x %v{c}** **Simplify**

SA = %v{a2} + %v{b2} + %v{c2} **Simplify**

SA = %v{sa} **Simplify**

The surface area of the prism is %v{sa} square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91104

A Water storage tank shaped like a rectangular prism is being built. The dimensions of the base are **5 ft** by **6 ft.** The height of the tank is **4 ft.** What is the total surface area of the tank?
If there is not enough information to solve, type 0.

Algebra:

✓ 148

✗ 0

Scaffold:

First draw a picture!

h = 4

w = 6

l = 5

We know that there is a pairs of walls with each of the following dimensions:

A: 5 ft by 4 ft
B: 5 ft by 6 ft
C: 6 ft by 4 ft

Each wall (A, B, and C) has an identical wall across from it (D, E, F)

The surface area of a rectangular prism is found by adding together the surface area of each individual side. There are 6 sides. For convenience we will label them with letters A through F.

SA = A + B + C + D + E + F

Because the prism is rectantangular, we know that sides opposite each other have equal surface area.

SA = 2 x **A** + 2 x **B** + 2 x **C**

The areas of each rectangular side can be found by multiplying the 2 dimensions of that side

SA = 2 x **(l x h)** + 2 x **(l x w)** + 2 x **(w x h)**

SA = 2 x **(5 x 4)** + 2 x **(5 x 6)** + 2 x **(6 x 4)** **Substitute Values**

SA = 2 x **20** + 2 x **30** + **2 x 24** **Simplify**

SA = 40 + 60 + 48 **Simplify**

SA = 148 **Simplify**

The surface area of the prism is 148 square inches

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

SURFACE AREA OF CONES

TEMPLATE # 69156

WITH VARIABLES

Base Area = %v{base} square inches
Side Area = %v{side} inches

What is the Surface Area of cone shown below? (square inches)

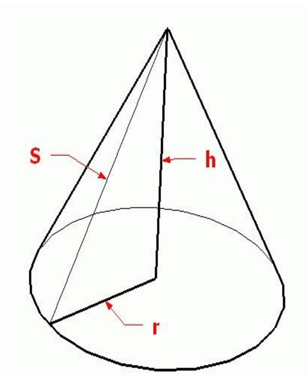


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

SA = Base Area + Side Area

SA = %v{base} + %v{side} **Simplify**

SA = %v{sa} **Simplify**

The surface area is %v{sa} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91114

Base Area = 37 square inches
Side Area = 54 inches

What is the Surface Area of cone shown below? (square inches)

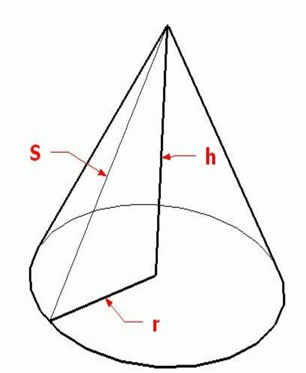


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ 91

✗ 0

Scaffold:

SA = Base Area + Side Area

SA = 37 + 54 **Simplify**

SA = 91 **Simplify**

The surface area is 91 square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69157

WITH VARIABLES

Base Area = %v{base} square inches
Total Surface Area = %v{sa} inches

What is the Side Surface Area of cone shown below? (square inches)

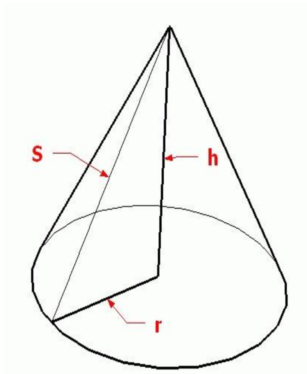


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

SA = Base Area + Side Area

%v{sa} = %v{base} + Side Area **Simplify**

%v{sa} - %v{base} = Side Area **Subtract %v{base} from both sides**

%v{side} = Side Area **Simplify**

The surface area of the side is %v{side} square inches.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91124

Base Area = 43 square inches
Total Surface Area = 125 inches

What is the Side Surface Area of cone shown below? (square inches)

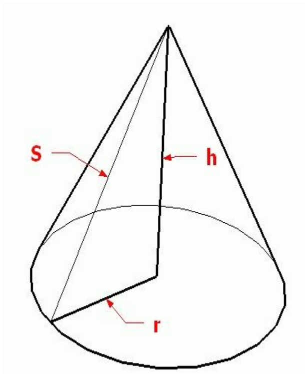


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

82

0

Scaffold:

SA = Base Area + Side Area

125 = 43 + Side Area **Simplify**

125 - 43 = Side Area **Subtract 43 from both sides**

82 = Side Area **Simplify**

The surface area of the side is 82 square inches.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69158

WITH VARIABLES

Side Area = %v{side} square inches
Total Surface Area = %v{sa} inches

What is the surface area of the circular base of the cone shown below? (square inches)

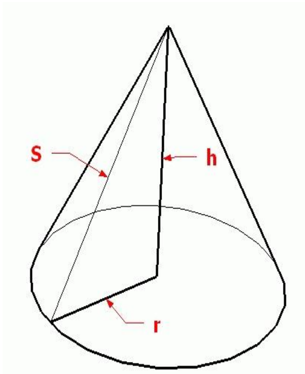


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:

✓ %v{answer}

✗ 0

Scaffold:

SA = Base Area + Side Area

%v{sa} = Base Area + %v{side} **Simplify**

%v{sa} - %v{side} = Base Area **Subtract %v{side} from both sides**

%v{side} = Base Area **Simplify**

The surface area of the base is %v{side} square inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91134

Side Area = 84 square inches
Total Surface Area = 110 inches

What is the surface area of the circular base of the cone shown below? (square inches)

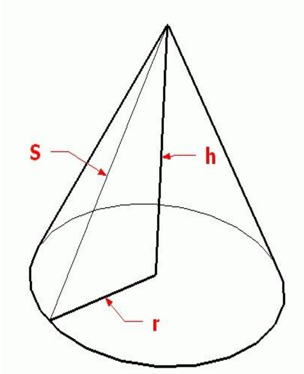


Image not to scale.

Use 3.14 for ∏. Round any decimals to the nearest Hundredth.
If there is not enough information to solve, type 0.

Algebra:
✓ 84
✗ 0

Scaffold:
SA = Base Area + Side Area

110 = Base Area + 84 **Simplify**

110 - 84 = Base Area **Subtract 84 from both sides**

84 = Base Area **Simplify**

The surface area of the base is 84 square inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69159

WITH VARIABLES

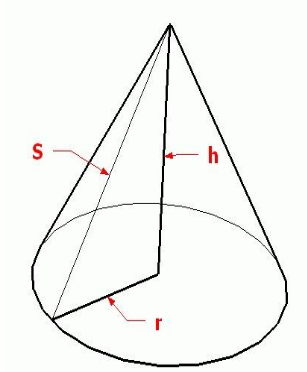
A cone shaped %v{storage} storage tank is being built. The surface area of the side is %v{side} square feet and the radius of the base is %v{radius} feet. What is the total surface area of the tank (in square feet)?

Use 3.14 for ∏. Assume the cone is a right circular cone.
If there is not enough information to solve, type 0.

Algebra:
✓ %v{answer}
✗ 0

Scaffold:

First, draw a picture:



Side Area: %v{side} square feet
Radius: %v{radius} feet

SA = Base Area + Side Area

We are given the Side Area, and we can calculate the Base Area because it is a circle and we are given the Radius

SA = ∏ x r^2 + Base Area **The bottom is a circle, the side area is Given**

SA = 3.14 x %v{radius}^{2} + %v{side} **Substitute Values**

SA = %v{base} + %v{side} **Simplify**

SA = %v{sa} **Simplify**

The total surface area is %v{sa} square feet.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91144

A cone shaped Water storage tank is being built. The surface area of the side is 50.24 square feet and the radius of the base is 4 feet. What is the total surface area of the tank (in square feet)?

Use 3.14 for ∏. Assume the cone is a right circular cone.
If there is not enough information to solve, type 0.

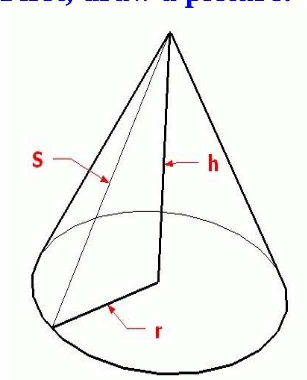
Algebra:

✓ 100.48

✗ 0

Scaffold:

First, draw a picture:



Side Area: 50.24 square feet
Radius: 4 feet

SA = Base Area + Side Area

We are given the Side Area, and we can calculate the Base Area because it is a circle and we are given the Radius

SA = ∏ x r^2 + Base Area	**The bottom is a circle, the side area is Given**
SA = 3.14 x 4^2 + 50.24	**Substitute Values**
SA = 50.24 + 50.24	**Simplify**
SA = 100.48	**Simplify**

The total surface area is 100.48 square feet.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

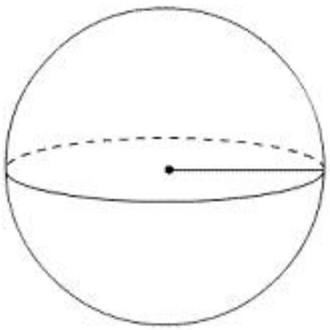
SURFACE AREA OF SPHERES

TEMPLATE # 69160

WITH VARIABLES

Assistment #69160 "69160 - 62930 - SA of Sphere (radius)"

The sphere below has a radius of %v{radius} inches.



What is the Surface Area of the sphere (in square inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{answer}

Scaffold:

Surface Area of A Sphere: 4 x Π x radius^2

SA = 4 x 3.14 x %v{radius}^{2} **Substitute Radius**

SA = 4 x 3.14 x %v{radius2} **Simplify**

SA = 12.56 x %v{radius2} **Simplify**

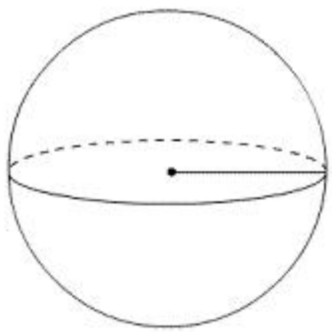
SA = %v{ans_f} **Simplify**

The Surface Area of the Sphere is %v{answer} square inches.

Multiple choice:
✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91154

The sphere below has a radius of 1 inches.



What is the Surface Area of the sphere (in square inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:
✓ 12.56

Scaffold:
Surface Area of A Sphere: $4 \times \Pi \times \text{radius}^2$

SA = $4 \times 3.14 \times 1^2$ **Substitute Radius**

SA = $4 \times 3.14 \times 1$ **Simplify**

SA = 12.56×1 **Simplify**

SA = 12.56 **Simplify**

The Surface Area of the Sphere is 12.56 square inches.

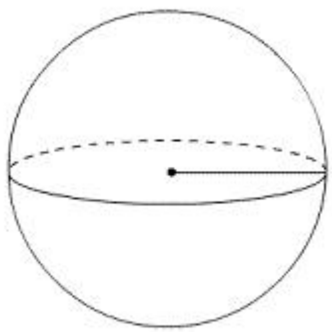
Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69161

WITH VARIABLES

The sphere below has a diameter of %v{diameter} inches.



What is the Surface Area of the sphere (in square inches)?

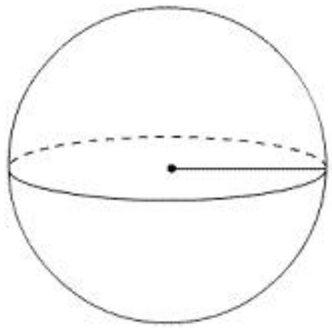
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{answer}

INSTANCE # 91174

The sphere below has a diameter of 8 inches.



What is the Surface Area of the sphere (in square inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 200.96

Scaffold:

Surface Area of A Sphere: $4 \times \Pi \times \text{radius}^2$

We are not given the radius, but we can find it:

$$r = \frac{d}{2}$$

$$r = \frac{8}{2} = 4$$

$SA = 4 \times 3.14 \times 4^2$ **Substitute Values**

$SA = 4 \times 3.14 \times 16$ **Simplify**

$SA = 12.56 \times 16$ **Simplify**

SA = 200.96 **Simplify**

The Surface Area of the Sphere is 200.96 square inches.

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

TEMPLATE #69162

WITH VARIABLES

A sphere-shaped %v{storage} storage tank with a radius of %v{radius} feet needs to be painted. What is the total surface area of the Sphere?

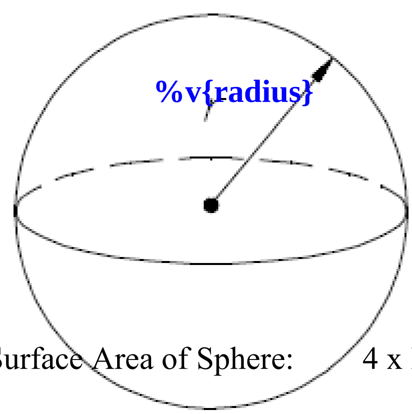
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

%v{answer}

Scaffold:

First, draw a picture:



Surface Area of Sphere: 4 x Π x radius^2

SA = 4 x 3.14 x %v{radius}^{2} **Substitute Radius**

SA = 4 x 3.14 x %v{radius2} **Simplify**

SA = 12.56 x %v{radius2} **Simplify**

SA = %v{ans_f} **Simplify**

The Surface Area of the Sphere is %v{answer} square inches.

Type %v{answer}

Multiple choice:

Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91184

A sphere-shaped Water storage tank with a radius of 5 feet needs to be painted. What is the total surface area of the Sphere?

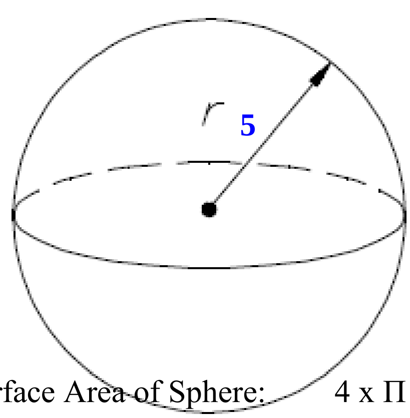
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

314

Scaffold:

First, draw a picture:



Surface Area of Sphere: 4 x Π x radius^2

SA = 4 x 3.14 x 5^2 **Substitute Radius**

SA = 4 x 3.14 x 25 **Simplify**

SA = 12.56 x 25 **Simplify**

SA = 314 **Simplify**

The Surface Area of the Sphere is 314 square inches.

Type 314

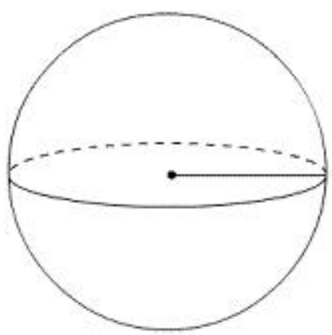
Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69163

WITH VARIABLES

The sphere below has a surface area of %v{answer} inches.



What is the radius of the sphere (in inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{radius}

Scaffold:

Surface Area of A Sphere: 4 x Π x $radius^2$

%v{answer} = 4 x 3.14 x r^2 **Substitute givens**

%v{answer} = 12.56 x r^2 **Simplify**

$r^2 = \dfrac{\%v\{answer\}}{12.56}$ = %v{radius2} **Divide both sides by 12.56**

r = √ (%v{radius2}) **Take the Square Root of Both Sides**

r = %v{radius} **Simplify**

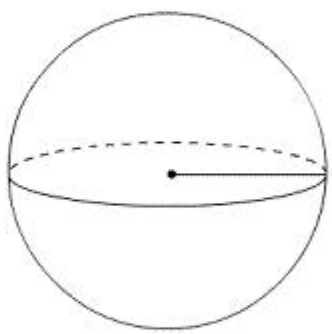
The Radius of the Sphere is %v{radius} inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

INSTANCE # 91194

The sphere below has a surface area of 50.24 inches.



What is the radius of the sphere (in inches)?

Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 2

Scaffold:

Surface Area of A Sphere: 4 x Π x radius^2

50.24 = 4 x 3.14 x r^2 **Substitute givens**

50.24 = 12.56 x r^2 **Simplify**

$r^2 = \frac{50.24}{12.56} = 4$ **Divide both sides by 12.56**

r = √ (4) **Take the Square Root of Both Sides**

r = 2 **Simplify**

The Radius of the Sphere is 2 inches.

Multiple choice:

✓ Ok. I have studied this example and am ready to get a new problem.

TEMPLATE # 69164

WITH VARIABLES

A sphere-shaped %v{storage} storage tank with surface area of %v{answer} square feet is being built. What is the radius of the sphere (in inches)?

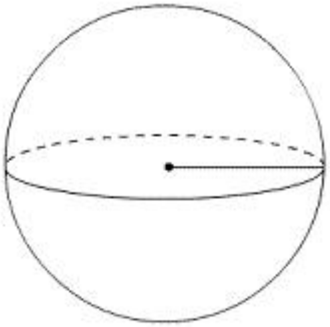
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ %v{radius}

Scaffold:

First, draw a picture:



Surface Area of A Sphere: 4 x Π x radius^2

%v{answer} = 4 x 3.14 x r^2 **Substitute givens**

%v{answer} = 12.56 x r^2 **Simplify**

$$r^2 = \frac{\%v\{answer\}}{12.56} = \%v\{radius2\}$$

Divide both sides by 12.56

r = √ (%v{radius2}) **Take the Square Root of Both Sides**

r = %v{radius} **Simplify**

The radius of the Sphere is %v{radius} inches.

TEMPLATE # 91204

A sphere-shaped Water storage tank with surface area of 314 square feet is being built. What is the radius of the sphere (in inches)?

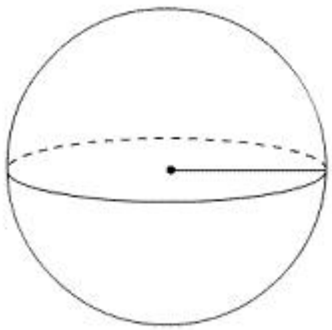
Use 3.14 for Π and round to the nearest hundredth.

Algebra:

✓ 5

Scaffold:

First, draw a picture:



Surface Area of A Sphere: $4 \times \Pi \times \text{radius}^2$

$314 = 4 \times 3.14 \times r^2$ **Substitute givens**

$314 = 12.56 \times r^2$ **Simplify**

$r^2 = \dfrac{314}{12.56} = 25$ **Divide both sides by 12.56**

$r = \sqrt{(25)}$ **Take the Square Root of Both Sides**

$r = 5$ **Simplify**

The radius of the Sphere is 5 inches.

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
2		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8829	Units
3		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8822	Units
4		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	9092	Volume
5		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8825	Units
6		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8830	Units
7		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8785	Units
8		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	9094	Surface Are
9		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8821	Units
10		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8824	Units
11		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	9095	Surface Are
12		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	9044	Volume
13		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	9091	Volume
14		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	9081	Volume
15	both	Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8828	Units
16		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8823	Units
17		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8820	Units
18		Forest Grov	54:11.8		64525	0.82469336	0.735873	Top Half	4th quartile	80	8827	Units
19		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8829	Units
20		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9493	Perimeter
21		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9491	Area
22		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9404	Area
23		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8822	Units
24		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9403	Area
25		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9092	Volume
26		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8825	Units
27		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8830	Units
28		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9472	Area
29		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9487	Area
30		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8785	Units
31		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9101	Surface Are
32		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9405	Perimeter
33		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9094	Surface Are

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
34		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8821	Units
35		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8824	Units
36		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9488	Area
37		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9095	Surface Are
38		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9489	Area
39		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9044	Volume
40		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9091	Volume
41		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9100	Surface Are
42		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9402	Area
43		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9081	Volume
44		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9490	Area
45		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9283	Area
46		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9471	Perimeter
47		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8828	Units
48		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8823	Units
49	time	Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8820	Units
50		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	9401	Area
51		Forest Grov	54:48.5	55:39.2	70688	0.78518519	0.735873	Top Half	4th quartile	70	8827	Units
52		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8829	Units
53		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8822	Units
54		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	9092	Volume
55		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8825	Units
56		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8830	Units
57		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8785	Units
58		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	9094	Surface Are
59		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8821	Units
60		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8824	Units
61		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	9044	Volume
62		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	9091	Volume
63		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	9081	Volume
64		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8828	Units
65	count	Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8823	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
66		Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8820	Units
67	count	Forest Grov	31:59.9		70702	0.73253968	0.735873	Bottom Half	2nd quartile	40	8827	Units
68		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8829	Units
69		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9491	Area
70		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9404	Area
71		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8822	Units
72		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9403	Area
73		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9092	Volume
74		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8825	Units
75		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8830	Units
76		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9472	Area
77		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9487	Area
78		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8785	Units
79		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9094	Surface Are
80		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8821	Units
81		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8824	Units
82		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9488	Area
83		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9489	Area
84		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9044	Volume
85		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9091	Volume
86		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9100	Surface Are
87		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9402	Area
88		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9490	Area
89		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9283	Area
90		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9471	Perimeter
91		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8828	Units
92		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8823	Units
93		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8820	Units
94		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	9401	Area
95		Forest Grov	25:43.1	29:20.1	70704	0.77255979	0.735873	Top Half	3rd quartile	60	8827	Units
96		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8829	Units
97		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9493	Perimeter

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
98		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8822	Units
99		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9092	Volume
100		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8825	Units
101		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9487	Area
102		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8785	Units
103		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9405	Perimeter
104		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8821	Units
105		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8824	Units
106		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9044	Volume
107		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9091	Volume
108		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9402	Area
109		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9283	Area
110		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	9471	Perimeter
111		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8828	Units
112		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8820	Units
113		Forest Grov	20:06.2	10:15.8	70707	0.78325532	0.735873	Top Half	3rd quartile	70	8827	Units
114		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8829	Units
115		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9493	Perimeter
116		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9491	Area
117		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9404	Area
118		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8822	Units
119		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9403	Area
120		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9092	Volume
121		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8825	Units
122		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8830	Units
123		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9472	Area
124		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9487	Area
125		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8785	Units
126		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9101	Surface Are
127		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9405	Perimeter
128		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9094	Surface Are
129		Forest Grov	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8821	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
130		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8824	Units
131		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9488	Area
132		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9095	Surface Are
133		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9489	Area
134	138	Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9044	Volume
135		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9091	Volume
136		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9100	Surface Are
137		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9402	Area
138		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9081	Volume
139		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9490	Area
140		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9283	Area
141		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9471	Perimeter
142		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8828	Units
143		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8823	Units
144		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8820	Units
145		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	9401	Area
146		Forest Gro\	44:55.9	47:01.7	70727	0.70793651	0.735873	Bottom Half	2nd quartile	20	8827	Units
147		Forest Gro\	06:48.5	08:25.6	70729	0.62962963	0.735873	Bottom Half	1st quartile	0	9403	Area
148		Forest Gro\	06:48.5	08:25.6	70729	0.62962963	0.735873	Bottom Half	1st quartile	0	9489	Area
149		Forest Gro\	06:48.5	08:25.6	70729	0.62962963	0.735873	Bottom Half	1st quartile	0	8827	Units
150		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8829	Units
151		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9493	Perimeter
152	time	Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9491	Area
153		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9404	Area
154		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8822	Units
155		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9403	Area
156		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9092	Volume
157		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8825	Units
158		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8830	Units
159		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9472	Area
160		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9487	Area
161		Forest Gro\	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8785	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
162		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9101	Surface Are
163		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9405	Perimeter
164		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9094	Surface Are
165		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8821	Units
166		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8824	Units
167		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9488	Area
168		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9095	Surface Are
169		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9489	Area
170		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9044	Volume
171		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9091	Volume
172		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9100	Surface Are
173		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9402	Area
174		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9081	Volume
175		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9490	Area
176		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9283	Area
177		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9471	Perimeter
178		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8828	Units
179		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8823	Units
180		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8820	Units
181		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	9401	Area
182		Forest Grov	33:30.0	34:37.7	70730	0.71026262	0.735873	Bottom Half	2nd quartile	20	8827	Units
183		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8829	Units
184		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8822	Units
185		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8825	Units
186		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8830	Units
187		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8785	Units
188		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8821	Units
189		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8824	Units
190		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	9091	Volume
191		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8828	Units
192		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8823	Units
193		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8820	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
194		Forest Grov	35:07.0		70731	0.86309524	0.735873	Top Half	4th quartile	90	8827	Units
195		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8822	Units
196		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8825	Units
197		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	9487	Area
198		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8785	Units
199		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8821	Units
200		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8824	Units
201		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	9283	Area
202		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8823	Units
203		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8820	Units
204		Forest Grov	58:37.4		70733	0.79497355	0.735873	Top Half	4th quartile	80	8827	Units
205		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8829	Units
206		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9493	Perimeter
207		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9491	Area
208		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9404	Area
209		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8822	Units
210	count	Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9403	Area
211		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9092	Volume
212		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8825	Units
213		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8830	Units
214		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9472	Area
215		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8785	Units
216		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9405	Perimeter
217		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9094	Surface Are
218		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8821	Units
219		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8824	Units
220		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9488	Area
221		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9095	Surface Are
222		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9489	Area
223		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9044	Volume
224		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9091	Volume
225		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9100	Surface Are

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
226		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9402	Area
227		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9081	Volume
228		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9490	Area
229		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9283	Area
230		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9471	Perimeter
231		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8828	Units
232		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8823	Units
233		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8820	Units
234		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	9401	Area
235		Forest Grov	49:23.2		70746	0.73657407	0.735873	Top Half	3rd quartile	50	8827	Units
236		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8829	Units
237		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9493	Perimeter
238		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9491	Area
239	time	Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9404	Area
240		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8822	Units
241		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9403	Area
242		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9092	Volume
243	time	Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8825	Units
244		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8830	Units
245		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9472	Area
246		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9487	Area
247		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8785	Units
248		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9101	Surface Are
249	time	Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9405	Perimeter
250		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9094	Surface Are
251		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8821	Units
252		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8824	Units
253		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9488	Area
254		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9095	Surface Are
255		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9489	Area
256		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9044	Volume
257		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9091	Volume

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
258		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9100	Surface Are
259		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9402	Area
260		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9081	Volume
261		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9490	Area
262		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9283	Area
263		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9471	Perimeter
264		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8828	Units
265		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8823	Units
266		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8820	Units
267		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	9401	Area
268		Forest Grov	53:26.4	55:24.7	71740	0.69178686	0.735873	Bottom Half	1st quartile	10	8827	Units
269		Forest Grov	07:14.3		71810	0.75	0.735873	Top Half	3rd quartile	60	8822	Units
270		Forest Grov	07:14.3		71810	0.75	0.735873	Top Half	3rd quartile	60	8785	Units
271		Forest Grov	07:14.3		71810	0.75	0.735873	Top Half	3rd quartile	60	8821	Units
272		Forest Grov	07:14.3		71810	0.75	0.735873	Top Half	3rd quartile	60	8824	Units
273		Forest Grov	07:14.3		71810	0.75	0.735873	Top Half	3rd quartile	60	8820	Units
274		Forest Grov	58:17.5		71824	0.68452381	0.735873	Bottom Half	1st quartile	10	9404	Area
275		Forest Grov	58:17.5		71824	0.68452381	0.735873	Bottom Half	1st quartile	10	9403	Area
276		Forest Grov	58:17.5		71824	0.68452381	0.735873	Bottom Half	1st quartile	10	9472	Area
277		Forest Grov	58:17.5		71824	0.68452381	0.735873	Bottom Half	1st quartile	10	9489	Area
278		Forest Grov	03:04.6		71831	1	0.735873	Top Half	4th quartile	90	9491	Area
279		Forest Grov	03:04.6		71831	1	0.735873	Top Half	4th quartile	90	9471	Perimeter
280		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8829	Units
281		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9493	Perimeter
282		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9491	Area
283		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9404	Area
284		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8822	Units
285		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9403	Area
286		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9092	Volume
287		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8825	Units
288		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8830	Units
289		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9472	Area

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
290		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9487	Area
291		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8785	Units
292		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9101	Surface Are
293		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9405	Perimeter
294		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9094	Surface Are
295		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8821	Units
296		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8824	Units
297		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9488	Area
298		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9095	Surface Are
299		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9489	Area
300		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9044	Volume
301		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9091	Volume
302		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9100	Surface Are
303		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9402	Area
304		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9081	Volume
305		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9490	Area
306		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9283	Area
307		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9471	Perimeter
308		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8828	Units
309		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8823	Units
310		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8820	Units
311		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	9401	Area
312		Forest Grov	49:43.6	50:47.3	71881	0.60939967	0.735873	Bottom Half	1st quartile	0	8827	Units
313		Forest Grov	59:11.4	03:32.9	71907	0.34583333	0.735873	Bottom Half	1st quartile	0	8822	Units
314		Forest Grov	59:11.4	03:32.9	71907	0.34583333	0.735873	Bottom Half	1st quartile	0	8785	Units
315		Forest Grov	59:11.4	03:32.9	71907	0.34583333	0.735873	Bottom Half	1st quartile	0	8821	Units
316		Forest Grov	59:11.4	03:32.9	71907	0.34583333	0.735873	Bottom Half	1st quartile	0	8824	Units
317		Forest Grov	59:11.4	03:32.9	71907	0.34583333	0.735873	Bottom Half	1st quartile	0	8823	Units
318		Forest Grov	59:11.4	03:32.9	71907	0.34583333	0.735873	Bottom Half	1st quartile	0	8820	Units
319		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8829	Units
320		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9493	Perimeter
321		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8822	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
322		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9403	Area
323		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9092	Volume
324		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8825	Units
325		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8830	Units
326		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8785	Units
327	count	Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9405	Perimeter
328		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9094	Surface Are
329		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8821	Units
330		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8824	Units
331		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9488	Area
332		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9044	Volume
333		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9091	Volume
334		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9100	Surface Are
335		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9402	Area
336		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9081	Volume
337		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	9471	Perimeter
338		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8828	Units
339		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8823	Units
340		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8820	Units
341		Forest Grov	01:01.4	02:00.7	73684	0.73922538	0.735873	Top Half	3rd quartile	60	8827	Units
342		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8829	Units
343		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9493	Perimeter
344		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9491	Area
345		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9404	Area
346		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8822	Units
347		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9403	Area
348		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9092	Volume
349		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8825	Units
350		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8830	Units
351		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9472	Area
352		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9487	Area
353		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8785	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
354		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9101	Surface Are
355		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9405	Perimeter
356		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9094	Surface Are
357		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8821	Units
358		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8824	Units
359		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9488	Area
360		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9095	Surface Are
361		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9489	Area
362		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9044	Volume
363		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9091	Volume
364		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9100	Surface Are
365	time	Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9402	Area
366		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9081	Volume
367		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9490	Area
368		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9283	Area
369		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9471	Perimeter
370		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8828	Units
371		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8823	Units
372	count	Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8820	Units
373		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	9401	Area
374		Forest Grov	37:25.6	45:22.8	73685	0.71371145	0.735873	Bottom Half	2nd quartile	20	8827	Units
375		Forest Grov	00:32.5		73962	0.86931818	0.735873	Top Half	4th quartile	90	8822	Units
376		Forest Grov	00:32.5		73962	0.86931818	0.735873	Top Half	4th quartile	90	8785	Units
377		Forest Grov	00:32.5		73962	0.86931818	0.735873	Top Half	4th quartile	90	8821	Units
378		Forest Grov	00:32.5		73962	0.86931818	0.735873	Top Half	4th quartile	90	8820	Units
379		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8822	Units
380		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8825	Units
381		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8785	Units
382		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8821	Units
383		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8824	Units
384		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8823	Units
385		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8820	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
386		Forest Grov	22:05.8	23:42.2	74384	0.86111111	0.735873	Top Half	4th quartile	90	8827	Units
387		Forest Grov	33:13.1		74676	0.9375	0.735873	Top Half	4th quartile	90	9092	Volume
388		Forest Grov	33:13.1		74676	0.9375	0.735873	Top Half	4th quartile	90	8821	Units
389		Forest Grov	33:13.1		74676	0.9375	0.735873	Top Half	4th quartile	90	9091	Volume
390		Forest Grov	33:13.1		74676	0.9375	0.735873	Top Half	4th quartile	90	8820	Units
391		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8829	Units
392		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9493	Perimeter
393		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9491	Area
394		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9404	Area
395		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8822	Units
396		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9403	Area
397		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9092	Volume
398		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8825	Units
399		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8830	Units
400		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9472	Area
401		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9487	Area
402		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8785	Units
403		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9405	Perimeter
404		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9094	Surface Are
405		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8821	Units
406		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8824	Units
407		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9488	Area
408		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9095	Surface Are
409		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9489	Area
410		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9044	Volume
411		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9091	Volume
412		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9402	Area
413		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9081	Volume
414		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9490	Area
415		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9283	Area
416		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9471	Perimeter
417		Forest Grov	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8828	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
418	time	Forest Gro\	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8823	Units
419		Forest Gro\	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8820	Units
420		Forest Gro\	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	9401	Area
421		Forest Gro\	49:39.3	51:34.6	74678	0.72166667	0.735873	Bottom Half	2nd quartile	30	8827	Units
422		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8822	Units
423		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	9403	Area
424		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8825	Units
425		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8785	Units
426		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8821	Units
427		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8824	Units
428	time	Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	9489	Area
429		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	9091	Volume
430		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	9471	Perimeter
431		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8820	Units
432		Forest Gro\	08:02.2	08:54.7	74698	0.63528139	0.735873	Bottom Half	1st quartile	0	8827	Units
433		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8829	Units
434		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9493	Perimeter
435		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9491	Area
436		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9404	Area
437		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8822	Units
438		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9403	Area
439		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9092	Volume
440		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8825	Units
441	count	Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8830	Units
442		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9472	Area
443		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9487	Area
444		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8785	Units
445		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9101	Surface Are
446		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9405	Perimeter
447		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9094	Surface Are
448		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8821	Units
449		Forest Gro\	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8824	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
450		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9488	Area
451		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9095	Surface Are
452		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9489	Area
453		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9044	Volume
454		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9091	Volume
455		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9100	Surface Are
456		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9402	Area
457		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9081	Volume
458		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9490	Area
459		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9283	Area
460		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9471	Perimeter
461		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8828	Units
462		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8823	Units
463		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8820	Units
464		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	9401	Area
465		Forest Grov	24:58.6	25:43.4	75169	0.73141525	0.735873	Bottom Half	2nd quartile	40	8827	Units
466		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9493	Perimeter
467		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9491	Area
468		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9404	Area
469		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9403	Area
470		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9472	Area
471		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9405	Perimeter
472		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	8821	Units
473		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9488	Area
474		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9489	Area
475		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9402	Area
476		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9490	Area
477		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9471	Perimeter
478		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	8820	Units
479		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	9401	Area
480		Forest Grov	34:14.2	10:58.0	75361	0.73587302	0.735873	Bottom Half	2nd quartile	50	8827	Units
481		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8829	Units

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Outlier**	**school_nar**	**start_time**	**end_time**	**user_id**	**student_avg**	**median**	**Med-Split**	**4th-split**	**10th split**	**sequence_**	**pr type**
482		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9493	Perimeter
483		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9491	Area
484		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9404	Area
485		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8822	Units
486		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9403	Area
487		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9092	Volume
488		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8825	Units
489		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8830	Units
490		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9472	Area
491		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9487	Area
492		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8785	Units
493		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9101	Surface Are
494		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9405	Perimeter
495		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9094	Surface Are
496		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8821	Units
497		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8824	Units
498		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9488	Area
499		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9095	Surface Are
500		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9489	Area
501		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9044	Volume
502		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9091	Volume
503		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9100	Surface Are
504		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9402	Area
505		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9081	Volume
506		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9490	Area
507		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9283	Area
508		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9471	Perimeter
509		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8828	Units
510		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8823	Units
511		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8820	Units
512		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	9401	Area
513		Forest Grov	32:05.2	41:27.5	80807	0.67132509	0.735873	Bottom Half	1st quartile	10	8827	Units

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
2	Yes	Complete Explanation	0.6	3	5	-0.352188065	90.08	0
3	Yes	Complete Explanation	0.5	3	6	-0.241564891	220.31	0
4	NO	No Condition	1	1	1	-0.794680762	12.26	-1
5	NO	Hints	0	0	2	-0.684057587	106.18	0
6	Yes	Hints	0.666667	2	3	-0.573434413	148.69	0
7	NO	Hints	0	0	1	-0.794680762	101.58	0
8	NO	No Condition	1	1	1	-0.794680762	176.97	-1
9	NO	No Condition	1	3	3	-0.573434413	193.07	0
10	Yes	Hints	0	0	18	1.0859132	288.79	0
11	NO	Hints	0.75	12	16	0.864666851	404.96	0
12	NO	Complete Explanation	0.65	13	20	1.307159548	443.49	0
13	Yes	No Condition	1	3	3	-0.573434413	143.74	0
14	NO	No Condition	1	2	2	-0.684057587	24.73	0
15	Yes	Hints	0.447917	43	96	9.714520787	4414.32	1
16	NO	Hints	0	0	1	-0.794680762	50.21	0
17	Yes	Complete Explanation	0.75	3	4	-0.462811239	115.81	1
18	Yes	Hints	0	0	19	1.196536374	411.18	0
19	Yes	Complete Explanation	0.833333	5	6	-0.241564891	171.16	0
20	Yes	No Condition	1	3	3	-0.573434413	178.7	0
21	Yes	Hints	0.714286	5	7	-0.130941716	229.13	1
22	Yes	No Condition	1	5	5	-0.352188065	298	0
23	Yes	No Condition	1	3	3	-0.573434413	80.55	0
24	Yes	No Condition	1	3	3	-0.573434413	24.08	0
25	Yes	Complete Explanation	0.888889	8	9	0.090304632	133.94	0
26	Yes	No Condition	1	5	5	-0.352188065	143.06	0
27	Yes	Complete Explanation	0.666667	4	6	-0.241564891	225.25	1
28	Yes	Hints	0.833333	5	6	-0.241564891	139.95	1
29	Yes	Hints	0.833333	5	6	-0.241564891	233.27	1
30	Yes	No Condition	1	3	3	-0.573434413	132.27	0
31	Yes	Hints	0.5	3	6	-0.241564891	240.9	0
32	Yes	Complete Explanation	0.3	3	10	0.200927806	757.85	0
33	NO	No Condition	1	1	1	-0.794680762	19.42	-1

	M	N	O	P	Q	R	S	T
1	finished	True Cond.	Prob Set A\	total_mast_	total_mast_seen	Z-problems_seen	time_in_maste	gain first 2
34	NO	Hints	0.727273	8	11	0.31155098	181.68	1
35	Yes	Hints	0.666667	4	6	-0.241564891	152.73	1
36	Yes	No Condition	1	3	3	-0.573434413	182.29	0
37	Yes	No Condition	1	3	3	-0.573434413	27.97	0
38	Yes	Complete Explanation	0.5	10	20	1.307159548	1047.61	0
39	Yes	Hints	0.6	3	5	-0.352188065	209.14	0
40	Yes	Hints	0.5	4	8	-0.020318542	1004.56	0
41	Yes	Complete Explanation	0.714286	5	7	-0.130941716	481.4	1
42	Yes	No Condition	1	3	3	-0.573434413	61.18	0
43	Yes	No Condition	1	3	3	-0.573434413	72.39	0
44	Yes	No Condition	1	3	3	-0.573434413	205.41	0
45	Yes	Complete Explanation	0.6	3	5	-0.352188065	238.72	0
46	Yes	No Condition	1	5	5	-0.352188065	94	0
47	Yes	Complete Explanation	0.8	8	10	0.200927806	133.4	-1
48	Yes	Hints	0.6875	11	16	0.864666851	1105.41	-1
49	Yes	Hints	0.571429	4	7	-0.130941716	796.7	1
50	Yes	Complete Explanation	0.818182	9	11	0.31155098	207.17	0
51	Yes	Complete Explanation	0.8	4	5	-0.352188065	244.69	1
52	NO	No Condition	1	3	3	-0.573434413	62.14	0
53	Yes	Complete Explanation	0.625	5	8	-0.020318542	481.5	0
54	Yes	Complete Explanation	0.6	3	5	-0.352188065	102.93	0
55	Yes	Complete Explanation	0.6	3	5	-0.352188065	122.39	0
56	Yes	Complete Explanation	0.571429	4	7	-0.130941716	283.53	-1
57	Yes	Hints	0.428571	3	7	-0.130941716	199.68	0
58	NO	Hints	0.583333	7	12	0.422174155	642.37	0
59	NO	Complete Explanation	0	0	1	-0.794680762	4.03	0
60	Yes	Hints	0.75	3	4	-0.462811239	59.95	1
61	Yes	Hints	0.571429	4	7	-0.130941716	278.77	1
62	Yes	No Condition	1	3	3	-0.573434413	18.33	0
63	Yes	No Condition	1	3	3	-0.573434413	119.77	0
64	Yes	Hints	0.454545	5	11	0.31155098	429.08	0
65	Yes	Hints	0	0	52	4.847101122	555.94	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
66	Yes	Hints	0	0	7	-0.130941716	938.96	0
67	Yes	Hints	0.054795	4	73	7.17018778	858.01	0
68	Yes	Complete Explanation	0.833333	5	6	-0.241564891	58.95	1
69	Yes	Complete Explanation	0.75	3	4	-0.462811239	82.36	1
70	Yes	No Condition	1	3	3	-0.573434413	52.33	0
71	Yes	No Condition	1	3	3	-0.573434413	140.03	0
72	Yes	Complete Explanation	0.857143	6	7	-0.130941716	40.87	-1
73	Yes	Hints	0.8	4	5	-0.352188065	49.75	-1
74	Yes	Hints	0.642857	9	14	0.643420503	277.12	1
75	Yes	No Condition	1	5	5	-0.352188065	55.03	0
76	Yes	Complete Explanation	0.833333	5	6	-0.241564891	64.17	1
77	Yes	Hints	0.666667	4	6	-0.241564891	361.97	1
78	Yes	Complete Explanation	0.833333	5	6	-0.241564891	127.99	1
79	NO	No Condition	1	5	5	-0.352188065	50.15	0
80	NO	No Condition	1	3	3	-0.573434413	54.17	0
81	Yes	No Condition	1	3	3	-0.573434413	37.1	0
82	Yes	Complete Explanation	0.571429	8	14	0.643420503	1090.42	0
83	NO	Complete Explanation	0	0	1	-0.794680762	56.98	0
84	NO	Complete Explanation	0.636364	7	11	0.31155098	296.21	1
85	Yes	No Condition	1	3	3	-0.573434413	27.61	0
86	NO	No Condition	1	3	3	-0.573434413	115.25	0
87	Yes	No Condition	1	3	3	-0.573434413	27.38	0
88	Yes	Hints	0.75	3	4	-0.462811239	153.85	1
89	Yes	Hints	0.8	4	5	-0.352188065	100.6	-1
90	Yes	Hints	0.384615	5	13	0.532797329	789.78	0
91	Yes	Hints	0.833333	5	6	-0.241564891	113.31	0
92	Yes	Hints	0.75	6	8	-0.020318542	179.28	-1
93	Yes	No Condition	1	3	3	-0.573434413	56.28	0
94	NO	Hints	0.833333	5	6	-0.241564891	116.69	0
95	Yes	Complete Explanation	0.5	4	8	-0.020318542	294.66	0
96	Yes	No Condition	1	5	5	-0.352188065	26.87	0
97	Yes	No Condition	1	5	5	-0.352188065	179.23	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
98	Yes	Hints	0.833333	5	6	-0.241564891	57.14	1
99	NO	Complete Explanation	0.75	3	4	-0.462811239	296.24	1
100	Yes	Hints	0.769231	10	13	0.532797329	138.31	1
101	NO	Hints	0.5	1	2	-0.684057587	259.48	-1
102	Yes	Complete Explanation	0.888889	8	9	0.090304632	187.1	0
103	Yes	No Condition	1	3	3	-0.573434413	27.96	0
104	NO	No Condition	1	5	5	-0.352188065	62.16	0
105	NO	No Condition	1	5	5	-0.352188065	160.59	0
106	NO	Hints	0	0	1	-0.794680762	21.68	0
107	NO	Complete Explanation	0.5	1	2	-0.684057587	45.59	-1
108	NO	No Condition	1	3	3	-0.573434413	21.04	0
109	NO	Hints	0	0	1	-0.794680762	30	0
110	NO	No Condition	1	3	3	-0.573434413	47.29	0
111	Yes	Hints	0.857143	6	7	-0.130941716	100.79	-1
112	Yes	No Condition	1	5	5	-0.352188065	54.95	0
113	Yes	No Condition	1	5	5	-0.352188065	52.4	0
114	Yes	No Condition	1	3	3	-0.573434413	50.03	0
115	Yes	No Condition	1	3	3	-0.573434413	58.2	0
116	Yes	No Condition	1	5	5	-0.352188065	58.87	0
117	Yes	No Condition	1	3	3	-0.573434413	34.97	0
118	Yes	No Condition	1	3	3	-0.573434413	27.15	0
119	Yes	No Condition	1	5	5	-0.352188065	92.78	0
120	Yes	Hints	0.8	8	10	0.200927806	165.53	-1
121	Yes	No Condition	1	3	3	-0.573434413	68.94	0
122	Yes	No Condition	1	5	5	-0.352188065	109.53	0
123	Yes	No Condition	1	5	5	-0.352188065	72.75	0
124	Yes	Complete Explanation	0.833333	5	6	-0.241564891	103.06	0
125	NO	Hints	0	0	1	-0.794680762	30	0
126	NO	No Condition	1	1	1	-0.794680762	30	-1
127	Yes	Complete Explanation	0.833333	5	6	-0.241564891	243.77	1
128	Yes	Hints	0.75	3	4	-0.462811239	55.74	1
129	NO	Hints	0	0	1	-0.794680762	30	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
130	Yes	No Condition	1	3	3	-0.573434413	14.5	0
131	Yes	Hints	0.5	3	6	-0.241564891	595.36	0
132	Yes	Complete Explanation	0.666667	4	6	-0.241564891	281.27	-1
133	Yes	Hints	0.8	4	5	-0.352188065	176.08	-1
134	Yes	Hints	0.533333	8	15	0.754043677	508.65	1
135	Yes	No Condition	1	3	3	-0.573434413	39.84	0
136	Yes	No Condition	1	3	3	-0.573434413	70.87	0
137	Yes	Complete Explanation	0.75	3	4	-0.462811239	47.37	1
138	Yes	No Condition	1	5	5	-0.352188065	36.78	0
139	Yes	No Condition	1	5	5	-0.352188065	42.64	0
140	Yes	No Condition	1	5	5	-0.352188065	64.72	0
141	Yes	No Condition	1	3	3	-0.573434413	184.4	0
142	Yes	Hints	0.75	6	8	-0.020318542	193.51	1
143	Yes	Complete Explanation	0.666667	2	3	-0.573434413	106.95	0
144	NO	No Condition	1	1	1	-0.794680762	34.43	-1
145	Yes	No Condition	1	3	3	-0.573434413	84	0
146	Yes	No Condition	1	5	5	-0.352188065	106.76	0
147	NO	Complete Explanation	0	0	1	-0.794680762	30	0
148	Yes	No Condition	1	5	5	-0.352188065	161.1	0
149	NO	Complete Explanation	0.888889	8	9	0.090304632	169.69	0
150	NO	No Condition	1	1	1	-0.794680762	20.46	-1
151	Yes	Hints	0.571429	4	7	-0.130941716	1102.64	0
152	Yes	Hints	0.833333	10	12	0.422174155	2148.14	0
153	Yes	No Condition	1	5	5	-0.352188065	348.12	0
154	Yes	No Condition	1	5	5	-0.352188065	83.88	0
155	Yes	Complete Explanation	0.5	3	6	-0.241564891	434.93	1
156	Yes	No Condition	1	5	5	-0.352188065	191.33	0
157	NO	No Condition	1	1	1	-0.794680762	147.44	-1
158	Yes	Complete Explanation	0.833333	5	6	-0.241564891	532.86	1
159	Yes	Complete Explanation	0.833333	10	12	0.422174155	170.84	0
160	Yes	No Condition	1	3	3	-0.573434413	36.97	0
161	Yes	No Condition	1	3	3	-0.573434413	46.95	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
162	Yes	No Condition	1	3	3	-0.573434413	34.33	0
163	Yes	Hints	0.833333	5	6	-0.241564891	61.15	1
164	Yes	Hints	0.666667	4	6	-0.241564891	101.97	1
165	NO	Complete Explanation	0.8	4	5	-0.352188065	77.55	-1
166	Yes	Complete Explanation	0.818182	9	11	0.31155098	146.41	-1
167	Yes	No Condition	1	5	5	-0.352188065	73.73	0
168	Yes	Hints	0.666667	4	6	-0.241564891	227.3	1
169	Yes	Complete Explanation	0.75	3	4	-0.462811239	157.01	1
170	NO	No Condition	1	5	5	-0.352188065	85.41	0
171	Yes	No Condition	1	3	3	-0.573434413	91.21	0
172	Yes	Hints	0.5	4	8	-0.020318542	452.56	1
173	Yes	Hints	0	0	6	-0.241564891	640.49	0
174	NO	Hints	0	0	1	-0.794680762	66.32	0
175	Yes	Complete Explanation	0.727273	8	11	0.31155098	137.76	1
176	Yes	Hints	0.8	4	5	-0.352188065	55.86	-1
177	NO	Complete Explanation	0	0	2	-0.684057587	49.97	0
178	Yes	No Condition	1	3	3	-0.573434413	12.09	0
179	Yes	Complete Explanation	0.6	3	5	-0.352188065	173.76	0
180	Yes	No Condition	1	3	3	-0.573434413	107.97	0
181	Yes	Complete Explanation	0.6	3	5	-0.352188065	424.91	0
182	Yes	Hints	0.571429	4	7	-0.130941716	193.33	0
183	Yes	No Condition	1	3	3	-0.573434413	119.1	0
184	Yes	No Condition	1	3	3	-0.573434413	35.86	0
185	Yes	No Condition	1	3	3	-0.573434413	58.67	0
186	Yes	No Condition	1	3	3	-0.573434413	49.77	0
187	Yes	Complete Explanation	0.8125	13	16	0.864666851	321.11	-1
188	NO	No Condition	1	5	5	-0.352188065	34.1	0
189	Yes	No Condition	1	5	5	-0.352188065	82.44	0
190	NO	Hints	0.8	4	5	-0.352188065	260.43	-1
191	Yes	Hints	0.64	16	25	1.860275419	520.72	-1
192	Yes	Complete Explanation	0.9	9	10	0.200927806	402.35	0
193	Yes	No Condition	1	3	3	-0.573434413	257.24	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
194	Yes	Hints	0.875	7	8	-0.020318542	53.81	0
195	Yes	No Condition	1	3	3	-0.573434413	83.57	0
196	Yes	Hints	0.75	3	4	-0.462811239	249.32	1
197	Yes	Hints	0.75	9	12	0.422174155	137.39	1
198	Yes	No Condition	1	5	5	-0.352188065	146.77	0
199	NO	Hints	0.777778	7	9	0.090304632	106.28	-1
200	Yes	No Condition	1	3	3	-0.573434413	52.19	0
201	NO	Complete Explanation	0	0	2	-0.684057587	121.38	0
202	NO	Complete Explanation	0	0	1	-0.794680762	28.41	0
203	Yes	Hints	0.636364	7	11	0.31155098	138.15	1
204	Yes	Hints	0.75	3	4	-0.462811239	65.27	1
205	NO	Complete Explanation	0.6	3	5	-0.352188065	414.37	0
206	NO	Hints	0	0	2	-0.684057587	216.58	0
207	NO	No Condition	1	3	3	-0.573434413	32.93	0
208	Yes	No Condition	1	3	3	-0.573434413	177.76	0
209	Yes	No Condition	1	3	3	-0.573434413	108.64	0
210	Yes	Hints	0.709677	22	31	2.524014464	357.26	0
211	Yes	Hints	0.833333	5	6	-0.241564891	119.49	1
212	Yes	Hints	0.777778	7	9	0.090304632	100.07	1
213	NO	Hints	0.75	6	8	-0.020318542	200.56	-1
214	NO	Hints	0.75	3	4	-0.462811239	415.98	0
215	Yes	Hints	0.846154	11	13	0.532797329	566.89	0
216	NO	No Condition	1	1	1	-0.794680762	5.58	-1
217	NO	Hints	0.9	9	10	0.200927806	237.77	0
218	NO	No Condition	1	5	5	-0.352188065	79.26	0
219	Yes	Hints	0.846154	11	13	0.532797329	189.61	0
220	Yes	Complete Explanation	0.9	9	10	0.200927806	334.48	0
221	NO	No Condition	1	5	5	-0.352188065	177.87	0
222	Yes	Hints	0.833333	5	6	-0.241564891	294.72	1
223	NO	No Condition	1	1	1	-0.794680762	35.44	-1
224	Yes	No Condition	1	5	5	-0.352188065	256.17	0
225	NO	Complete Explanation	0.875	7	8	-0.020318542	235.5	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
226	Yes	No Condition	1	5	5	-0.352188065	208.64	0
227	NO	No Condition	1	5	5	-0.352188065	120.1	0
228	Yes	No Condition	1	3	3	-0.573434413	189.72	0
229	NO	No Condition	1	3	3	-0.573434413	158.35	0
230	NO	No Condition	1	3	3	-0.573434413	358.68	0
231	Yes	No Condition	1	5	5	-0.352188065	167.59	0
232	Yes	Complete Explanation	0.6	3	5	-0.352188065	385.6	0
233	Yes	Hints	0.75	3	4	-0.462811239	141.18	1
234	NO	No Condition	1	5	5	-0.352188065	111.33	0
235	NO	Complete Explanation	0.736842	14	19	1.196536374	883.28	-1
236	Yes	No Condition	1	3	3	-0.573434413	209.51	0
237	Yes	No Condition	1	5	5	-0.352188065	170.58	0
238	Yes	Hints	0.777778	7	9	0.090304632	206.12	1
239	Yes	No Condition	1	3	3	-0.573434413	320.9	0
240	Yes	No Condition	1	3	3	-0.573434413	53.39	0
241	Yes	Hints	0.7	7	10	0.200927806	1842.56	1
242	NO	No Condition	1	1	1	-0.794680762	131.24	-1
243	Yes	Complete Explanation	0.833333	5	6	-0.241564891	495.65	1
244	Yes	No Condition	1	3	3	-0.573434413	106.29	0
245	Yes	No Condition	1	3	3	-0.573434413	291.41	0
246	Yes	No Condition	1	3	3	-0.573434413	26.34	0
247	Yes	Hints	0.363636	4	11	0.31155098	668.34	0
248	Yes	Complete Explanation	0.6	3	5	-0.352188065	351.63	0
249	Yes	Hints	0.416667	5	12	0.422174155	1974.1	0
250	Yes	No Condition	1	3	3	-0.573434413	180.53	0
251	NO	Complete Explanation	0.333333	3	9	0.090304632	965.15	0
252	Yes	No Condition	1	3	3	-0.573434413	71.51	0
253	Yes	No Condition	1	3	3	-0.573434413	158.73	0
254	Yes	Hints	0.75	3	4	-0.462811239	555.32	1
255	Yes	No Condition	1	5	5	-0.352188065	154.37	0
256	Yes	No Condition	1	5	5	-0.352188065	114.73	0
257	Yes	No Condition	1	5	5	-0.352188065	134.99	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
258	Yes	Hints	0.333333	3	9	0.090304632	2468.45	0
259	Yes	Complete Explanation	0.727273	8	11	0.31155098	329.03	-1
260	Yes	Hints	0.642857	9	14	0.643420503	386.35	0
261	Yes	Hints	0.5	2	4	-0.462811239	207.28	0
262	NO	Hints	0	0	2	-0.684057587	150.84	0
263	Yes	No Condition	1	3	3	-0.573434413	78.35	0
264	Yes	No Condition	1	3	3	-0.573434413	86.58	0
265	Yes	Hints	0.333333	1	3	-0.573434413	84.23	1
266	NO	Complete Explanation	0	0	1	-0.794680762	30	0
267	Yes	Hints	0.592593	16	27	2.081521767	704.39	0
268	Yes	No Condition	1	5	5	-0.352188065	118.9	0
269	NO	No Condition	1	1	1	-0.794680762	66.06	-1
270	NO	Hints	0	0	1	-0.794680762	16.32	0
271	NO	No Condition	1	5	5	-0.352188065	71.85	0
272	NO	Complete Explanation	0.75	6	8	-0.020318542	174.32	1
273	Yes	No Condition	1	3	3	-0.573434413	112.5	0
274	Yes	Hints	0.75	3	4	-0.462811239	76.63	1
275	Yes	Hints	0.571429	8	14	0.643420503	500.41	0
276	NO	Complete Explanation	0.666667	8	12	0.422174155	290.84	-1
277	NO	Complete Explanation	0.75	3	4	-0.462811239	113.26	1
278	NO	No Condition	1	3	3	-0.573434413	15.48	0
279	NO	No Condition	1	5	5	-0.352188065	89.99	0
280	Yes	Hints	0.5	5	10	0.200927806	255.29	1
281	Yes	Hints	0.875	7	8	-0.020318542	141.71	0
282	Yes	Hints	0.9	9	10	0.200927806	138.11	0
283	Yes	Complete Explanation	0.6	9	15	0.754043677	745.75	0
284	Yes	No Condition	1	3	3	-0.573434413	111.06	0
285	Yes	Hints	0.5	5	10	0.200927806	1177.19	0
286	NO	No Condition	1	1	1	-0.794680762	21.34	-1
287	Yes	No Condition	1	5	5	-0.352188065	96.86	0
288	Yes	Complete Explanation	0.833333	5	6	-0.241564891	79.15	0
289	Yes	Complete Explanation	0.615385	8	13	0.532797329	1371.28	1

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
290	Yes	No Condition	1	3	3	-0.573434413	15.15	0
291	Yes	Hints	0.6	3	5	-0.352188065	229.77	0
292	Yes	Complete Explanation	0.8	4	5	-0.352188065	147	-1
293	Yes	Complete Explanation	0.5	6	12	0.422174155	1178.1	1
294	Yes	Hints	0.571429	4	7	-0.130941716	479.12	1
295	NO	Complete Explanation	0.75	3	4	-0.462811239	218.86	1
296	Yes	No Condition	1	3	3	-0.573434413	80.61	0
297	Yes	Hints	0.75	3	4	-0.462811239	199.37	1
298	Yes	No Condition	1	3	3	-0.573434413	23.18	0
299	Yes	Hints	0.5625	9	16	0.864666851	438.71	0
300	Yes	Hints	0.75	6	8	-0.020318542	80.47	1
301	Yes	Complete Explanation	0.9	9	10	0.200927806	391.7	0
302	Yes	Complete Explanation	0.5	4	8	-0.020318542	1581.25	0
303	Yes	Hints	0.857143	6	7	-0.130941716	52.49	-1
304	Yes	Complete Explanation	0.44	11	25	1.860275419	452	-1
305	NO	Complete Explanation	0	0	1	-0.794680762	30	0
306	Yes	Hints	0	0	4	-0.462811239	333.61	0
307	Yes	Hints	0.6	3	5	-0.352188065	167.41	0
308	Yes	Complete Explanation	0.833333	5	6	-0.241564891	69.74	1
309	Yes	No Condition	1	3	3	-0.573434413	18.97	0
310	Yes	Hints	0.5	6	12	0.422174155	274.84	0
311	Yes	Complete Explanation	0.777778	7	9	0.090304632	144.54	1
312	Yes	Complete Explanation	0.526316	10	19	1.196536374	810.7	-1
313	NO	Complete Explanation	0	0	1	-0.794680762	89.04	0
314	Yes	No Condition	1	5	5	-0.352188065	80.11	0
315	NO	Complete Explanation	0.2	1	5	-0.352188065	889.96	1
316	NO	Complete Explanation	0	0	2	-0.684057587	193.55	0
317	NO	Complete Explanation	0	0	1	-0.794680762	23.07	0
318	Yes	Complete Explanation	0.875	7	8	-0.020318542	126.95	0
319	NO	Hints	0	0	2	-0.684057587	60.62	0
320	Yes	No Condition	1	3	3	-0.573434413	45.6	0
321	NO	Complete Explanation	0	0	1	-0.794680762	30	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
322	Yes	Hints	0.454545	5	11	0.31155098	162.2	0
323	Yes	No Condition	1	5	5	-0.352188065	271.99	0
324	Yes	No Condition	1	5	5	-0.352188065	78.61	0
325	Yes	No Condition	1	5	5	-0.352188065	95.03	0
326	NO	Hints	0	0	1	-0.794680762	77.6	0
327	Yes	Complete Explanation	0.5	11	22	1.528405896	527.44	0
328	NO	Complete Explanation	0.818182	9	11	0.31155098	186.74	-1
329	NO	Complete Explanation	0.75	9	12	0.422174155	433.09	0
330	Yes	Hints	0.857143	6	7	-0.130941716	153.86	-1
331	Yes	No Condition	1	3	3	-0.573434413	105.65	0
332	Yes	No Condition	1	5	5	-0.352188065	86.59	0
333	NO	Hints	0	0	1	-0.794680762	20.7	0
334	NO	No Condition	1	5	5	-0.352188065	159.28	0
335	Yes	Hints	0.111111	1	9	0.090304632	231.11	-1
336	Yes	No Condition	1	5	5	-0.352188065	137.54	0
337	Yes	Hints	0.777778	7	9	0.090304632	316.19	0
338	Yes	No Condition	1	5	5	-0.352188065	253.04	0
339	Yes	Hints	0.875	7	8	-0.020318542	181.52	0
340	Yes	Hints	0.857143	6	7	-0.130941716	211.8	-1
341	Yes	No Condition	1	5	5	-0.352188065	95.27	0
342	Yes	No Condition	1	5	5	-0.352188065	88.71	0
343	Yes	No Condition	1	5	5	-0.352188065	109.43	0
344	NO	Complete Explanation	0	0	1	-0.794680762	53.88	0
345	Yes	No Condition	1	5	5	-0.352188065	163.34	0
346	NO	Complete Explanation	0	0	1	-0.794680762	8.31	0
347	Yes	No Condition	1	5	5	-0.352188065	113.42	0
348	Yes	No Condition	1	5	5	-0.352188065	101.51	0
349	Yes	No Condition	1	5	5	-0.352188065	126.86	0
350	Yes	Complete Explanation	0.857143	6	7	-0.130941716	166.36	-1
351	Yes	No Condition	1	5	5	-0.352188065	88.87	0
352	Yes	Hints	0.714286	5	7	-0.130941716	302.09	1
353	Yes	No Condition	1	3	3	-0.573434413	170.82	0

	M	N	O	P	Q	R	S	T
1	finished	True Cond.	Prob Set A\	total_mast_	total_mast_seen	Z-problems_seen	time_in_maste	gain first 2
354	Yes	Complete Explanation	0.7	7	10	0.200927806	323.22	0
355	Yes	Hints	0.833333	5	6	-0.241564891	273.58	1
356	NO	No Condition	1	3	3	-0.573434413	42.86	0
357	NO	Hints	0.75	3	4	-0.462811239	62.12	1
358	Yes	Complete Explanation	0.888889	8	9	0.090304632	103.11	0
359	Yes	Hints	0.888889	8	9	0.090304632	96.99	0
360	NO	Complete Explanation	0.6	3	5	-0.352188065	263.04	0
361	Yes	Hints	0.833333	5	6	-0.241564891	124.79	1
362	Yes	No Condition	1	5	5	-0.352188065	93.15	0
363	Yes	Hints	0.666667	4	6	-0.241564891	314.14	-1
364	Yes	No Condition	1	3	3	-0.573434413	51.53	0
365	Yes	Complete Explanation	0.411765	7	17	0.975290026	2497.87	0
366	NO	Hints	0	0	1	-0.794680762	57.71	0
367	Yes	No Condition	1	5	5	-0.352188065	174.15	0
368	Yes	No Condition	1	3	3	-0.573434413	30.03	0
369	Yes	No Condition	1	3	3	-0.573434413	308.83	0
370	Yes	Complete Explanation	0.75	3	4	-0.462811239	65.09	1
371	Yes	Complete Explanation	0.333333	5	15	0.754043677	526.01	1
372	Yes	Hints	0.466667	7	15	0.754043677	561.62	0
373	Yes	Hints	0.5	7	14	0.643420503	1577.61	1
374	Yes	No Condition	1	3	3	-0.573434413	205.37	0
375	NO	No Condition	1	3	3	-0.573434413	178.6	0
376	Yes	No Condition	1	3	3	-0.573434413	52.54	0
377	NO	Hints	0.727273	8	11	0.31155098	268.88	0
378	Yes	Hints	0.75	3	4	-0.462811239	145.77	1
379	NO	Hints	0.75	6	8	-0.020318542	286.48	-1
380	Yes	Hints	0.888889	8	9	0.090304632	103.05	0
381	Yes	No Condition	1	5	5	-0.352188065	53.02	0
382	NO	Complete Explanation	0.625	5	8	-0.020318542	644.28	-1
383	NO	Complete Explanation	0.75	9	12	0.422174155	360.16	0
384	Yes	Hints	0.333333	1	3	-0.573434413	67.62	-1
385	Yes	Hints	0.833333	5	6	-0.241564891	84.37	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
386	NO	Hints	0	0	1	-0.794680762	28.34	0
387	NO	No Condition	1	5	5	-0.352188065	94.97	0
388	NO	Complete Explanation	0.75	3	4	-0.462811239	147.58	1
389	Yes	No Condition	1	3	3	-0.573434413	26.38	0
390	Yes	No Condition	1	3	3	-0.573434413	77.02	0
391	Yes	No Condition	1	5	5	-0.352188065	89.95	0
392	Yes	No Condition	1	3	3	-0.573434413	32.9	0
393	Yes	No Condition	1	3	3	-0.573434413	45.17	0
394	Yes	No Condition	1	5	5	-0.352188065	74.86	0
395	Yes	No Condition	1	5	5	-0.352188065	129.46	0
396	Yes	Hints	0.75	3	4	-0.462811239	230.58	1
397	Yes	No Condition	1	5	5	-0.352188065	149.17	0
398	Yes	Hints	0.857143	6	7	-0.130941716	127.09	-1
399	Yes	Hints	0.833333	5	6	-0.241564891	281.76	0
400	Yes	Complete Explanation	0.75	3	4	-0.462811239	114.86	1
401	Yes	Complete Explanation	0.466667	7	15	0.754043677	1596.76	0
402	NO	No Condition	1	1	1	-0.794680762	10.25	-1
403	Yes	Complete Explanation	0.857143	6	7	-0.130941716	149.29	-1
404	NO	No Condition	1	3	3	-0.573434413	40.02	0
405	NO	No Condition	1	3	3	-0.573434413	144.34	0
406	Yes	No Condition	1	3	3	-0.573434413	10.96	0
407	Yes	Complete Explanation	0.75	3	4	-0.462811239	331.37	1
408	NO	No Condition	1	3	3	-0.573434413	80.08	0
409	Yes	Complete Explanation	0.333333	3	9	0.090304632	889.95	0
410	Yes	Hints	0.714286	5	7	-0.130941716	165.35	1
411	Yes	No Condition	1	3	3	-0.573434413	71.08	0
412	Yes	No Condition	1	3	3	-0.573434413	26.8	0
413	Yes	No Condition	1	3	3	-0.573434413	101.43	0
414	Yes	No Condition	1	3	3	-0.573434413	75.3	0
415	Yes	No Condition	1	5	5	-0.352188065	80.1	0
416	Yes	No Condition	1	5	5	-0.352188065	46.48	0
417	Yes	No Condition	1	5	5	-0.352188065	144.17	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
418	Yes	Complete Explanation	0.6	9	15	0.754043677	1424.18	0
419	Yes	Hints	0.833333	5	6	-0.241564891	92.47	1
420	NO	Hints	0	0	1	-0.794680762	16.64	0
421	Yes	No Condition	1	5	5	-0.352188065	192.71	0
422	Yes	No Condition	1	3	3	-0.573434413	44.42	0
423	Yes	No Condition	1	5	5	-0.352188065	683.29	0
424	NO	Hints	0	0	1	-0.794680762	10.32	0
425	Yes	No Condition	1	5	5	-0.352188065	112.36	0
426	NO	Complete Explanation	0.75	3	4	-0.462811239	300.83	1
427	NO	No Condition	1	5	5	-0.352188065	66.42	0
428	Yes	Hints	0.571429	12	21	1.417782722	2775.4	1
429	NO	No Condition	1	1	1	-0.794680762	23.6	-1
430	Yes	Hints	0.666667	2	3	-0.573434413	185.02	0
431	Yes	Hints	0	0	4	-0.462811239	705.29	0
432	NO	Complete Explanation	0	0	2	-0.684057587	109.25	0
433	Yes	No Condition	1	3	3	-0.573434413	86.79	0
434	NO	Hints	0	0	1	-0.794680762	113.43	0
435	Yes	No Condition	1	5	5	-0.352188065	299.09	0
436	Yes	No Condition	1	5	5	-0.352188065	69.68	0
437	Yes	No Condition	1	5	5	-0.352188065	75.48	0
438	Yes	Hints	0.857143	6	7	-0.130941716	110.12	-1
439	Yes	No Condition	1	3	3	-0.573434413	69.23	0
440	Yes	No Condition	1	3	3	-0.573434413	52.21	0
441	Yes	Hints	0.764706	13	17	0.975290026	516.58	0
442	Yes	No Condition	1	3	3	-0.573434413	32.72	0
443	Yes	Complete Explanation	0.571429	4	7	-0.130941716	129.08	1
444	Yes	Hints	0.857143	6	7	-0.130941716	137.36	-1
445	Yes	Hints	0.8	8	10	0.200927806	193.26	-1
446	Yes	Complete Explanation	0.571429	4	7	-0.130941716	199.53	0
447	Yes	No Condition	1	3	3	-0.573434413	60.08	0
448	NO	Complete Explanation	0.9	9	10	0.200927806	133.39	0
449	NO	Hints	0	0	1	-0.794680762	128.46	0

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
450	NO	No Condition	1	1	1	-0.794680762	26.54	-1
451	Yes	No Condition	1	5	5	-0.352188065	102.49	0
452	Yes	No Condition	1	3	3	-0.573434413	22.1	0
453	Yes	Hints	0.8	4	5	-0.352188065	45.36	-1
454	NO	Complete Explanation	0	0	2	-0.684057587	334.38	0
455	Yes	Hints	0.714286	5	7	-0.130941716	261.35	1
456	NO	Hints	0	0	1	-0.794680762	140.38	0
457	Yes	No Condition	1	3	3	-0.573434413	55.21	0
458	Yes	No Condition	1	3	3	-0.573434413	37.38	0
459	Yes	Complete Explanation	0.8	4	5	-0.352188065	122.03	-1
460	Yes	Hints	0.75	3	4	-0.462811239	202.53	1
461	Yes	No Condition	1	5	5	-0.352188065	109.02	0
462	Yes	No Condition	1	5	5	-0.352188065	56.44	0
463	Yes	Complete Explanation	0.8	8	10	0.200927806	265.02	0
464	NO	Hints	0	0	2	-0.684057587	156.93	0
465	Yes	Hints	0.857143	6	7	-0.130941716	153.39	-1
466	NO	Complete Explanation	0.5	1	2	-0.684057587	24.46	-1
467	Yes	Complete Explanation	0.833333	5	6	-0.241564891	130.37	1
468	Yes	Complete Explanation	0.666667	6	9	0.090304632	443.84	0
469	Yes	No Condition	1	5	5	-0.352188065	60.57	0
470	Yes	No Condition	1	5	5	-0.352188065	389.52	0
471	Yes	No Condition	1	5	5	-0.352188065	51.37	0
472	NO	Complete Explanation	0	0	5	-0.352188065	846.39	0
473	NO	Hints	0	0	1	-0.794680762	73.86	0
474	Yes	Hints	0.8	8	10	0.200927806	225.63	1
475	Yes	Complete Explanation	0.571429	4	7	-0.130941716	662.05	0
476	Yes	Hints	0.666667	2	3	-0.573434413	88.74	0
477	Yes	No Condition	1	3	3	-0.573434413	60.17	0
478	NO	No Condition	1	5	5	-0.352188065	94.94	0
479	NO	No Condition	1	5	5	-0.352188065	92.2	0
480	NO	No Condition	1	5	5	-0.352188065	63.64	0
481	Yes	Complete Explanation	0.666667	4	6	-0.241564891	544.7	1

	M	N	O	P	Q	R	S	T
1	**finished**	**True Cond.**	**Prob Set A**	**total_mast_**	**total_mast_seen**	**Z-problems_seen**	**time_in_maste**	**gain first 2**
482	Yes	No Condition	1	3	3	-0.573434413	36.84	0
483	Yes	No Condition	1	3	3	-0.573434413	56.29	0
484	Yes	Hints	0.75	9	12	0.422174155	317.07	1
485	Yes	No Condition	1	3	3	-0.573434413	59.37	0
486	Yes	Complete Explanation	0.75	3	4	-0.462811239	89	1
487	Yes	No Condition	1	5	5	-0.352188065	126.66	0
488	Yes	No Condition	1	5	5	-0.352188065	84.66	0
489	Yes	Hints	0.833333	5	6	-0.241564891	230.67	0
490	Yes	No Condition	1	3	3	-0.573434413	122.04	0
491	Yes	No Condition	1	5	5	-0.352188065	84.04	0
492	Yes	Complete Explanation	0.75	3	4	-0.462811239	524.43	1
493	Yes	No Condition	1	3	3	-0.573434413	40.87	0
494	Yes	Hints	0.555556	5	9	0.090304632	900.44	0
495	NO	No Condition	1	1	1	-0.794680762	95.76	-1
496	NO	Complete Explanation	0.833333	5	6	-0.241564891	147.94	1
497	Yes	No Condition	1	3	3	-0.573434413	20.37	0
498	Yes	No Condition	1	3	3	-0.573434413	254.84	0
499	Yes	Hints	0.833333	5	6	-0.241564891	118.88	0
500	Yes	No Condition	1	3	3	-0.573434413	371.26	0
501	Yes	Hints	0.833333	5	6	-0.241564891	333.81	0
502	Yes	Complete Explanation	0.8	4	5	-0.352188065	466.35	-1
503	Yes	Hints	0.8	4	5	-0.352188065	123.81	-1
504	Yes	No Condition	1	3	3	-0.573434413	93.48	0
505	Yes	No Condition	1	3	3	-0.573434413	76.5	0
506	Yes	No Condition	1	3	3	-0.573434413	85.77	0
507	Yes	Hints	0.75	3	4	-0.462811239	43.18	1
508	Yes	No Condition	1	5	5	-0.352188065	90.74	0
509	Yes	Complete Explanation	0.833333	5	6	-0.241564891	220.15	1
510	Yes	Complete Explanation	0.9	9	10	0.200927806	280.49	0
511	Yes	No Condition	1	3	3	-0.573434413	331.99	0
512	Yes	Complete Explanation	0.888889	8	9	0.090304632	161.07	0
513	Yes	No Condition	1	3	3	-0.573434413	39.31	0

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		**Hints**		**Total Sum of total_mast_seen**	**Total Sum of Prob Set AVG**
Row Labels	**Sum of total_mast_se**	**Sum of Prob Set AV**	**Sum of total_mast_seen**	**Sum of Prob Set AVG**		
64525	**20**	**0.65**	**20**	**0.75**	**40**	**1.4**
8785			**1**	**0**	**1**	**0**
Units			1	0	1	0
8823			**1**	**0**	**1**	**0**
Units			1	0	1	0
8825			**2**	**0**	**2**	**0**
Units			2	0	2	0
9044	**20**	**0.65**			**20**	**0.65**
Volume	20	0.65			20	0.65
9095			**16**	**0.75**	**16**	**0.75**
Surface Area			16	0.75	16	0.75
70688			**11**	**0.727272727**	**11**	**0.727272727**
8821			**11**	**0.727272727**	**11**	**0.727272727**
Units			11	0.727272727	11	0.727272727
70702	**1**	**0**	**12**	**0.583333333**	**13**	**0.583333333**
8821	**1**	**0**			**1**	**0**
Units	1	0			1	0
9094			**12**	**0.583333333**	**12**	**0.583333333**
Surface Area			12	0.583333333	12	0.583333333
70704	**12**	**0.636363636**	**6**	**0.833333333**	**18**	**1.46969697**
9044	**11**	**0.636363636**			**11**	**0.636363636**
Volume	11	0.636363636			11	0.636363636
9401			**6**	**0.833333333**	**6**	**0.833333333**
Area			6	0.833333333	6	0.833333333
9489	**1**	**0**			**1**	**0**
Area	1	0			1	0

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		**Hints**		**Total Sum of total_mast_seen**	**Total Sum of Prob Set AVG**
Row Labels	**Sum of total_mast_se**	**Sum of Prob Set AV**	**Sum of total_mast_seen**	**Sum of Prob Set AVG**		
70707	**6**	**1.25**	**4**	**0.5**	**10**	**1.75**
9044			**1**	**0**	**1**	**0**
Volume			1	0	1	0
9091	**2**	**0.5**			**2**	**0.5**
Volume	2	0.5			2	0.5
9092	**4**	**0.75**			**4**	**0.75**
Volume	4	0.75			4	0.75
9283			**1**	**0**	**1**	**0**
Area			1	0	1	0
9487			**2**	**0.5**	**2**	**0.5**
Area			2	0.5	2	0.5
70727			**2**	**0**	**2**	**0**
8785			**1**	**0**	**1**	**0**
Units			1	0	1	0
8821			**1**	**0**	**1**	**0**
Units			1	0	1	0
70730	**7**	**0.8**	**1**	**0**	**8**	**0.8**
8821	**5**	**0.8**			**5**	**0.8**
Units	5	0.8			5	0.8
9081			**1**	**0**	**1**	**0**
Volume			1	0	1	0
9471	**2**	**0**			**2**	**0**
Perimeter	2	0			2	0
70731			**5**	**0.8**	**5**	**0.8**
9091			**5**	**0.8**	**5**	**0.8**
Volume			5	0.8	5	0.8

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		Hints		Total Sum of total_mast_seen	Total Sum of Prob Set AVG
Row Labels	Sum of total_mast_se	Sum of Prob Set AV	Sum of total_mast_seen	Sum of Prob Set AVG		
70733	**3**	**0**	**9**	**0.777777778**	**12**	**0.777777778**
8821			**9**	**0.777777778**	**9**	**0.777777778**
Units			9	0.777777778	9	0.777777778
8823	**1**	**0**			**1**	**0**
Units	1	0			1	0
9283	**2**	**0**			**2**	**0**
Area	2	0			2	0
70746	**32**	**2.211842105**	**24**	**2.4**	**56**	**4.611842105**
8827	**19**	**0.736842105**			**19**	**0.736842105**
Units	19	0.736842105			19	0.736842105
8829	**5**	**0.6**			**5**	**0.6**
Units	5	0.6			5	0.6
8830			**8**	**0.75**	**8**	**0.75**
Units			8	0.75	8	0.75
9094			**10**	**0.9**	**10**	**0.9**
Surface Area			10	0.9	10	0.9
9100	**8**	**0.875**			**8**	**0.875**
Surface Area	8	0.875			8	0.875
9472			**4**	**0.75**	**4**	**0.75**
Area			4	0.75	4	0.75
9493			**2**	**0**	**2**	**0**
Perimeter			2	0	2	0
71740	**10**	**0.333333333**	**2**	**0**	**12**	**0.333333333**
8820	**1**	**0**			**1**	**0**
Units	1	0			1	0
8821	**9**	**0.333333333**			**9**	**0.333333333**

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		Hints		Total Sum of total_mast_seen	Total Sum of Prob Set AVG
Row Labels	**Sum of total_mast_se**	**Sum of Prob Set AV**	**Sum of total_mast_seen**	**Sum of Prob Set AVG**		
Units	9	0.333333333			9	0.333333333
9283			**2**	**0**	**2**	**0**
Area			2	0	2	0
71810	**8**	**0.75**	**1**	**0**	**9**	**0.75**
8785			**1**	**0**	**1**	**0**
Units			1	0	1	0
8824	**8**	**0.75**			**8**	**0.75**
Units	8	0.75			8	0.75
71824	**16**	**1.416666667**			**16**	**1.416666667**
9472	**12**	**0.666666667**			**12**	**0.666666667**
Area	12	0.666666667			12	0.666666667
9489	**4**	**0.75**			**4**	**0.75**
Area	4	0.75			4	0.75
71881	**5**	**0.75**			**5**	**0.75**
8821	**4**	**0.75**			**4**	**0.75**
Units	4	0.75			4	0.75
9490	**1**	**0**			**1**	**0**
Area	1	0			1	0
73684	**24**	**1.568181818**	**4**	**0**	**28**	**1.568181818**
8785			**1**	**0**	**1**	**0**
Units			1	0	1	0
8821	**12**	**0.75**			**12**	**0.75**
Units	12	0.75			12	0.75
8822	**1**	**0**			**1**	**0**
Units	1	0			1	0
8829			**2**	**0**	**2**	**0**

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		Hints		Total Sum of total_mast_seen	Total Sum of Prob Set AVG
Row Labels	**Sum of total_mast_se**	**Sum of Prob Set AV**	**Sum of total_mast_seen**	**Sum of Prob Set AVG**		
Units			2	0	2	0
9091			**1**	**0**	**1**	**0**
Volume			1	0	1	0
9094	**11**	**0.818181818**			**11**	**0.818181818**
Surface Area	11	0.818181818			11	0.818181818
73685	**7**	**0.6**	**5**	**0.75**	**12**	**1.35**
8821			**4**	**0.75**	**4**	**0.75**
Units			4	0.75	4	0.75
8822	**1**	**0**			**1**	**0**
Units	1	0			1	0
9081			**1**	**0**	**1**	**0**
Volume			1	0	1	0
9095	**5**	**0.6**			**5**	**0.6**
Surface Area	5	0.6			5	0.6
9491	**1**	**0**			**1**	**0**
Area	1	0			1	0
74384	**20**	**1.375**	**9**	**0.75**	**29**	**2.125**
8821	**8**	**0.625**			**8**	**0.625**
Units	8	0.625			8	0.625
8822			**8**	**0.75**	**8**	**0.75**
Units			8	0.75	8	0.75
8824	**12**	**0.75**			**12**	**0.75**
Units	12	0.75			12	0.75
8827			**1**	**0**	**1**	**0**
Units			1	0	1	0
74678			**1**	**0**	**1**	**0**

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		Hints		Total Sum of total_mast_seen	Total Sum of Prob Set AVG
Row Labels	Sum of total_mast_se	Sum of Prob Set AV	Sum of total_mast_seen	Sum of Prob Set AVG		
9401			**1**	**0**	**1**	**0**
Area			1	0	1	0
74698	**6**	**0.75**	**1**	**0**	**7**	**0.75**
8821	**4**	**0.75**			**4**	**0.75**
Units	4	0.75			4	0.75
8825			**1**	**0**	**1**	**0**
Units			1	0	1	0
8827	**2**	**0**			**2**	**0**
Units	2	0			2	0
75169	**12**	**0.9**	**5**	**0**	**17**	**0.9**
8821	**10**	**0.9**			**10**	**0.9**
Units	10	0.9			10	0.9
8824			**1**	**0**	**1**	**0**
Units			1	0	1	0
9091	**2**	**0**			**2**	**0**
Volume	2	0			2	0
9401			**2**	**0**	**2**	**0**
Area			2	0	2	0
9402			**1**	**0**	**1**	**0**
Area			1	0	1	0
9493			**1**	**0**	**1**	**0**
Perimeter			1	0	1	0
75361	**7**	**0.5**	**1**	**0**	**8**	**0.5**
8821	**5**	**0**			**5**	**0**
Units	5	0			5	0
9488			**1**	**0**	**1**	**0**

Outlier	(Multiple Items)
True Cond.	(Multiple Items)
finished2	NO

	Column Labels					
	Complete Explanation		Hints		Total Sum of total_mast_seen	Total Sum of Prob Set AVG
Row Labels	**Sum of total_mast_se**	**Sum of Prob Set AV**	**Sum of total_mast_seen**	**Sum of Prob Set AVG**		
Area			1	0	1	0
9493	**2**	**0.5**			**2**	**0.5**
Perimeter	2	0.5			2	0.5
80807	**6**	**0.833333333**			**6**	**0.833333333**
8821	**6**	**0.833333333**			**6**	**0.833333333**
Units	6	0.833333333			6	0.833333333
Grand Total	**202**	**15.32472089**	**123**	**8.871717172**	**325**	**24.19643806**