

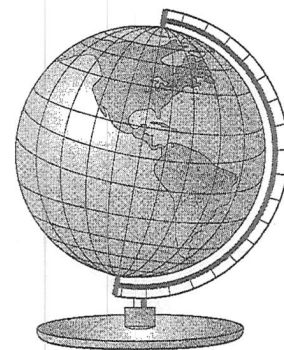
# Practice & Apply

## 5.3 Exploring Circumferences and Areas of Circles

Use the  $\pi$  key on your calculator or use 3.14 for  $\pi$ . As needed, round answers to the nearest tenth.

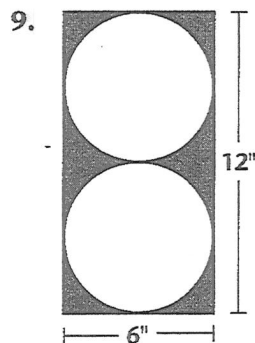
1. If  $r = 10$  cm, then the circumference = \_\_\_\_\_.
2. If  $r = 10$  cm, then the area = \_\_\_\_\_.
3. If  $d = 22$  cm, then the circumference = \_\_\_\_\_.
4. If  $d = 22$  cm, then the area = \_\_\_\_\_.
5. If the area of a circle =  $121\pi$  in.<sup>2</sup>, then the radius = \_\_\_\_\_.
6. If the area of a circle =  $121\pi$  in.<sup>2</sup>, then the circumference = \_\_\_\_\_.
7. If the circumference =  $42\pi$  cm, then the area = \_\_\_\_\_.
8. Phineas wants to circle the Earth in 80 days in his ship named *Phog*. If he plans to travel nonstop at a constant speed along the equator, at what speed should he travel?  
(Note: diameter of Earth  $\approx$  8000 miles)

\_\_\_\_\_

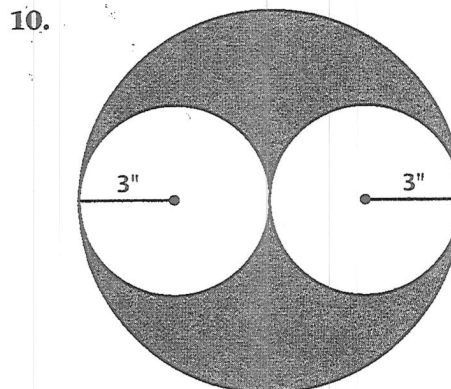


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For Exercises 9–10, find the area of the shaded region.



\_\_\_\_\_



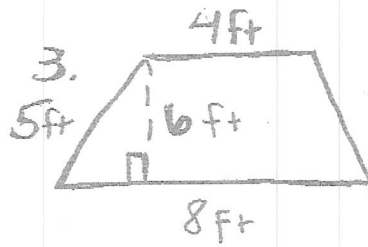
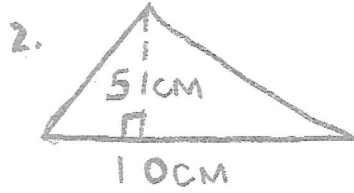
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Practice Quiz

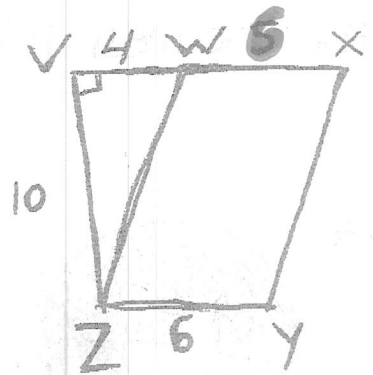
Area & Circumference

Find the area of the figure.



Use the diagram on the right to answer #5-7

5. Find the area of parallelogram WXYZ.



6. Find the area of triangle VWZ.

7. Find the area of trapezoid VXYZ.

8. The area of a triangle is  $36 \text{ cm}^2$ . Find the height of the triangle if its base is 12 cm.

Find the circumference. Round answers to the nearest tenth.

9.  $r = 10$

10.  $d = 6$

April 10, 2007

geometry

# Pythagorean Theorem.

- Square roots:

perfect squares:  $1 \cdot 1 = 1 \quad \sqrt{1} = 1$

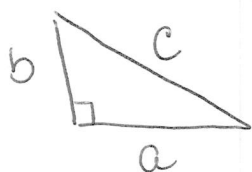
$2 \cdot 2 = 4 \quad \sqrt{4} = 2$

$3 \cdot 3 = 9 \quad \sqrt{9} = 3$  etc.

## Pythagorean Theorem

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

$\wedge$              $\wedge$   
 legs        hyp.  
 of a right  $\Delta$



→ Examples

1. Find c
2. Find a & b
3. Diagonal problem

Now if  $c^2 > a^2 + b^2$   $\Delta ABC =$  obtuse  $\Delta$  \* In any  $\Delta$  with c as its longest side

$c^2 < a^2 + b^2$   $\Delta ABC =$  acute  $\Delta$

$c^2 = a^2 + b^2$   $\Delta ABC =$  right  $\Delta$

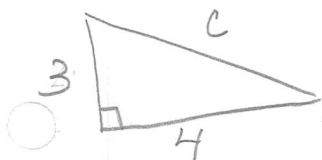
→ examples of each.

pg 271  
 classwork # 5-15

HW: Practice Quiz

\* Tomorrow 4/11/07 (wea) Quiz (area, perimeter, circumference)  
 parallelogram, trapezoid,  $\Delta$ , circle.

examples:

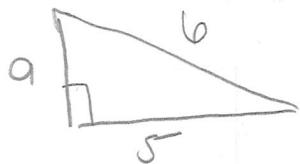


$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

$$\sqrt{25} = \sqrt{c^2}$$

$$5 = c$$



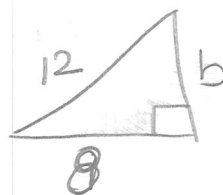
$$a^2 + 5^2 = b^2$$

$$a^2 + 25 = 36$$

$$-25 \quad -25$$

$$\sqrt{a^2} = \sqrt{11}$$

$$a = 3.3$$



$$8^2 + b^2 = 12^2$$

$$64 + b^2 = 144$$

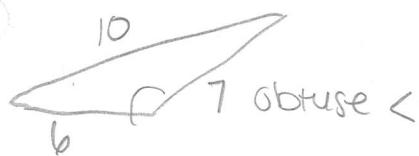
$$-64$$

$$\sqrt{b^2} = \sqrt{80}$$

$$b = 8.9$$

Now - given 3 sides tell me if it is acute, obtuse, Right  
 obtuse longest side = c

$$c^2 > a^2 + b^2$$



$$10^2 > 6^2 + 7^2$$

$$100 > 36 + 49 = 85$$

$$100 > 85$$

acute



$$9^2 < 8^2 + 7^2$$

$$81 < 64 + 49$$

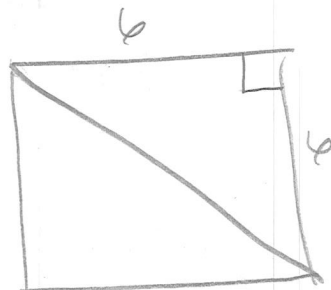
$$81 < 113$$

Right

$$3, 4, 5$$

$$5^2 = 3^2 + 4^2$$

$$25 = 9 + 16 \checkmark$$



Diagonal = ?

side = b

Square = Rt  $\angle$ 's

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

$$36 + 36 = c^2$$

$$c = 8.48$$

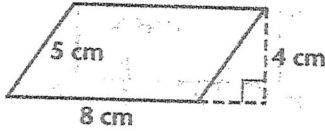
$$\sqrt{72} = \sqrt{c^2} =$$



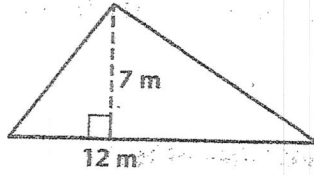
Name: \_\_\_\_\_  
 Area and Circumference Quiz

Find the area of each figure.

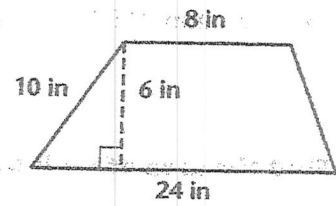
1.



2.

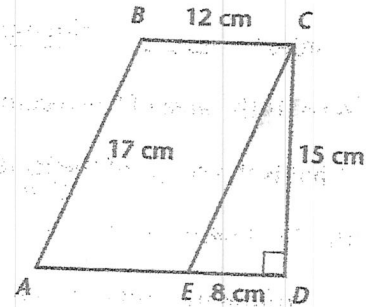


3.



Use the diagram

- 4 Find the area of parallelogram  $ABCE$ . \_\_\_\_\_
- 5 Find the area of triangle  $CDE$ . \_\_\_\_\_
- 6 Find the area of trapezoid  $ABCD$ . \_\_\_\_\_
- 7 The area of a triangle is  $48 \text{ cm}^2$ . Find the height of the triangle if its base is 6 cm. \_\_\_\_\_



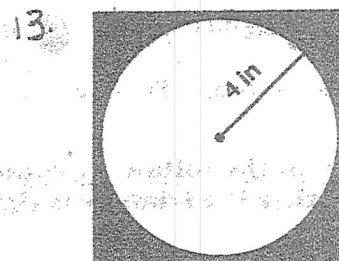
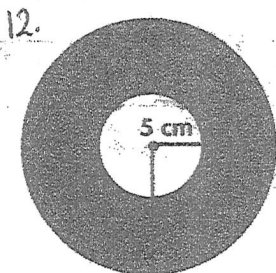
Find the circumference. Round answers to the nearest tenth.

8.  $r = 12 \text{ cm}$  \_\_\_\_\_      9.  $d = 5 \text{ in.}$  \_\_\_\_\_

Find the area. Round answers to the nearest tenth.

10.  $r = 8 \text{ m}$  \_\_\_\_\_      11.  $d = 9 \text{ ft}$  \_\_\_\_\_

For Exercise 5–6, find the area of the shaded region. Give answers to the nearest hundredth.



\_\_\_\_\_

# 5-3A Alternative Lesson

Name \_\_\_\_\_

Date \_\_\_\_\_

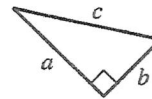
## KEY TERMS

Pythagorean Theorem Pythagorean triple

The Pythagorean Theorem describes a special relationship among the lengths of the sides of a right triangle.

### PYTHAGOREAN THEOREM

In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

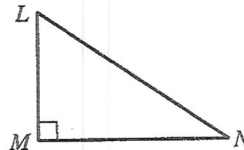


$$a^2 + b^2 = c^2$$

The Pythagorean Theorem can be used to calculate the length of any side of a right triangle when the lengths of the other two sides are known.

### EXAMPLES

The lengths of two sides of right triangle  $LMN$  are given. Find the length of the third side.



1.  $LM = 4, MN = 6$

$$LM^2 + MN^2 = LN^2$$

$$4^2 + 6^2 = LN^2$$

$$16 + 36 = LN^2$$

$$52 = LN^2$$

$$\sqrt{52} = LN$$

$$7.21 \approx LN$$

The Pythagorean Theorem  
Substitute in the equation.

Use a calculator to find the square root.  
Round to the nearest hundredth.

2.  $MN = 5, LN = 8$

$$LM^2 + MN^2 = LN^2$$

$$LM^2 + 5^2 = 8^2$$

$$LM^2 + 25 = 64$$

$$LM^2 = 64 - 25$$

$$LM = \sqrt{39}$$

$$LM \approx 6.24$$

### TRY IT

The lengths of two sides of right triangle  $ABC$  are given. Find the length of the third side. Express the missing length as a decimal rounded to the nearest hundredth.

a.  $AB = 8, BC = 6$

\_\_\_\_\_ + \_\_\_\_\_ =  $AC^2$

\_\_\_\_\_ + \_\_\_\_\_ =  $AC^2$

\_\_\_\_\_ + \_\_\_\_\_ =  $AC^2$

\_\_\_\_\_ =  $AC^2$

\_\_\_\_\_ =  $AC$

\_\_\_\_\_ =  $AC$

b.  $AB = 7, AC = 9$

\_\_\_\_\_

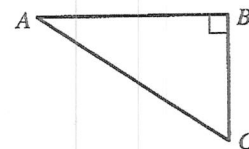
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**5-3A Alternative Lesson (continued)**

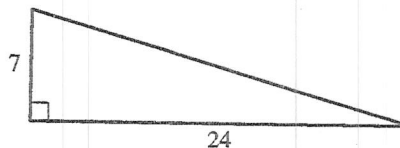
Name \_\_\_\_\_

There are some special sets of positive integers for which  $a^2 + b^2 = c^2$ . In Exercise a. the sides of the right triangle were 6, 8, and 10. These integers are a **Pythagorean triple**.

**EXAMPLE**

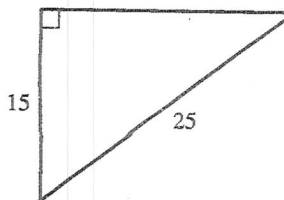
Find the length of the missing side of each right triangle. Then identify the corresponding Pythagorean triple.

$$\begin{aligned}
 3. \quad a^2 + b^2 &= c^2 \\
 7^2 + 24^2 &= c^2 \\
 49 + 576 &= c^2 \\
 625 &= c^2 \\
 \sqrt{625} &= c \\
 25 &= c
 \end{aligned}$$



The Pythagorean triple  $a, b, c$  is 7, 24, 25

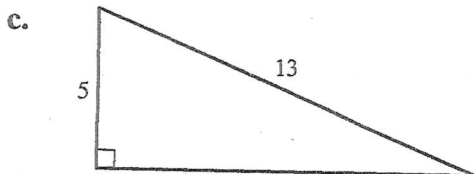
$$\begin{aligned}
 4. \quad a^2 + b^2 &= c^2 \\
 225 + b^2 &= 625 \\
 b^2 &= 625 - 225 \\
 b^2 &= 400 \\
 b &= \sqrt{400} \\
 b &= 20
 \end{aligned}$$



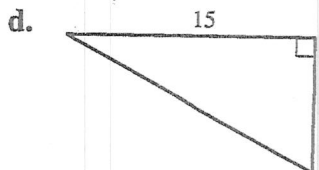
The Pythagorean triple  $a, b, c$  is 15, 20, 25.

**TRY IT**

Find the length of the missing side of each right triangle. Then identify the corresponding Pythagorean triple.



The missing side length is \_\_\_\_\_.  
 The Pythagorean triple is 5, \_\_\_\_\_, 13.



The missing side length is \_\_\_\_\_.  
 The Pythagorean triple is \_\_\_\_\_.

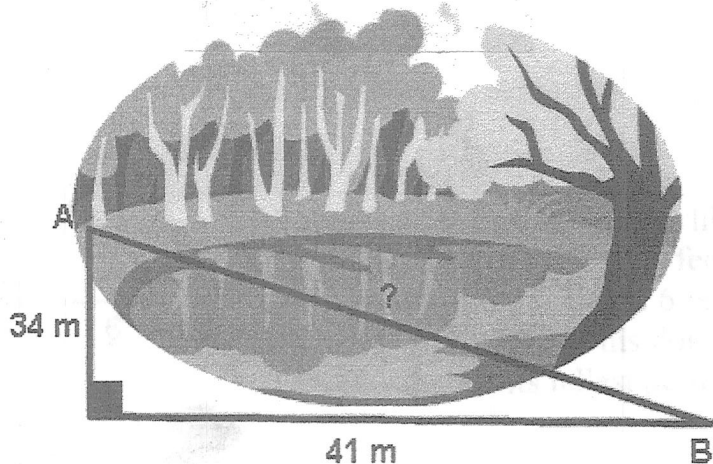
**Summary** The Pythagorean Theorem describes the relationship among the lengths of the sides of a right triangle. It states that the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. Sets of positive integers for which  $a^2 + b^2 = c^2$  are called Pythagorean triples.

Name: \_\_\_\_\_

# Pythagorean Theorem

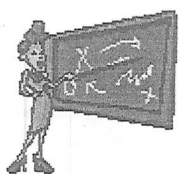
Solve the following word problems using the Pythagorean Theorem

1.)



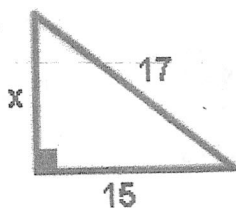
To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the *nearest meter*, how many meters would be saved if it were possible to walk through the pond?

2.)



Ms. Green tells you that a right triangle has a hypotenuse of 13 and a leg of 5. She asks you to find the other leg of the triangle without using paper and pencil. What is your answer?

3.)



Find  $x$



April 12, 2001

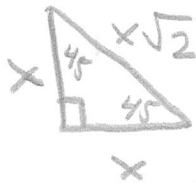
Geometry

Notes:

Can use easier ways to find sides of Right triangles other than Pythagorean theorem.

45-45-90

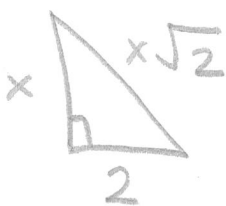
hyp is  $\sqrt{2}$  times larger than the legs.  
legs are of = length bc of the equal angles across.



\* Isosceles  $\Delta$  bc it has 2 sides

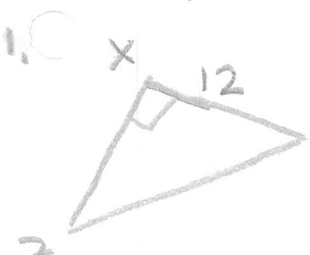
$$L = \frac{1}{2} H \sqrt{2}$$

1. So if



what does the other leg = ? (2)  
what does the hyp = ?  $2\sqrt{2}$

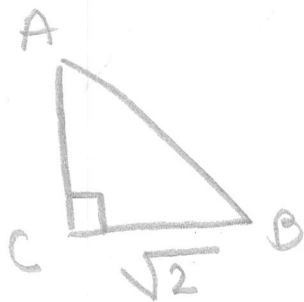
Examples:



what is the hyp?  $\overline{zy}$   
what is the leg?  $\overline{xy}$   $\overline{xz}$

$$\overline{xz} = ? \quad 12$$

$$\overline{zy} = 12\sqrt{2}$$

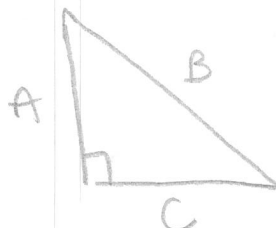


hyp = ?  $\overline{AB}$   
legs = ?  $\overline{AC}$ ,  $\overline{CB}$   
 $AC = \sqrt{2}$   
 $AB = \sqrt{2} \cdot \sqrt{2} = \sqrt{4} = 2$

$$3.) \quad L = \frac{4\sqrt{2}\sqrt{2}}{2} = 2\sqrt{5}$$

$$4.) \quad \frac{\sqrt{10}\sqrt{2}\sqrt{20}}{2}$$

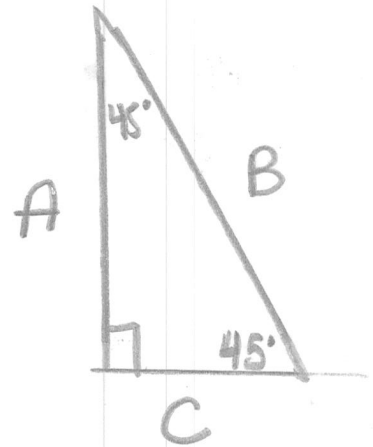
	1	2	3	4
A	*3	1.5	4	$\sqrt{5}$
B	$3\sqrt{2}$	$1.5\sqrt{2}$	* $4\sqrt{2}$	* $\sqrt{10}$
C	3	*1.5	4	$4\sqrt{5}$



Name: \_\_\_\_\_

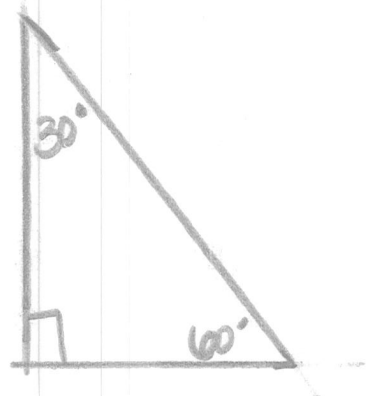
Complete the table using the  $45^\circ - 45^\circ - 90^\circ$  theorem.

	1	2	3	4
A	3			
B			$4\sqrt{2}$	$\sqrt{10}$
C		1.5		



Complete the table using the  $30^\circ - 60^\circ - 90^\circ$  theorem.

	1	2	3	4
A		$8\sqrt{3}$		3
B	4			
C			10	



## Number Sense & Operations Review Sheet

### I. Vocabulary:

**Integer:** either a whole number or negative of a whole number.

**Rational Number:** +/- numbers that can be expressed as a ratio of two integers

(-3, -1/5, 0, 1/3, 1/2, 5)

**Irrational Number:** numbers that cannot be expressed as a ratio of two integers & whose decimal form do not come to an end or have a repeating decimal.  
(pi or square root of 2)

**Factors:** integers by which a given integer can be evenly divided.

**Multiples:** integers that can be divided by a given integer.

**Prime:** integer with only two factors, one and itself.

**Reciprocal:** the product of a number & its reciprocal is always ONE

**Absolute Value:** distance from zero on a number line. (POSITIVE)

### II. Converting Decimals to Fractions:

\*Determine place value of last digit, that is your denominator

### III. Converting Fractions to Decimals:

\*Divide the numerator by the denominator (TOP BY BOTTOM)

### IV. Rules for +, -, x, / Positives & Negatives:

Adding Same Signs: Add together and keep sign

Adding Diff. Signs: Subtract and take sign of larger number

Subtracting: Rewrite the first integer and add the opposite of second.

Pos. X/ Pos. = Pos.      Neg. X/ Neg. = Pos.

Pos. X/ Neg. = Neg.      Neg. X/ Pos. = Neg.

### V. Exponents:

\*When you multiply numbers with same base, add the exponents

\*When you divide numbers with same base, subtract the exponents.

\*If you raise an exponent to a power, multiply the exponents.

\*A number raised to the zero power = 1

\*When you raise a fraction between 0 & 1, the number gets smaller.

\*Negative Exponents make fractions

### VI. Square Roots:

\*What number times itself gives us this number?

### VII. Percents:

\*Means out of 100

\*Remember to use the BAR METHOD for percent problems

20% of 45?

120 is 30% of what number?

12 is what percent of 60?

### VIII. Percent Increase/Decrease:

\*Formula =  $\frac{\text{Amount of Change}}{\text{Original Amount}}$

Name: \_\_\_\_\_

Testing Review

Label each number as rational or irrational.

1. 3.458978684125 \_\_\_\_\_

2. -5 \_\_\_\_\_

3.  $\frac{1}{2}$  \_\_\_\_\_

4.  $\sqrt{2}$  \_\_\_\_\_

List the factors of the numbers below.

5. 10

6. 80

7. 17

8. 24

Find a multiple of the numbers below.

9. 4, 6

10. 10, 5

11. 7, 4

12. 6, 3

State whether the each number is prime.

13. 7 \_\_\_\_\_

14. 45 \_\_\_\_\_

15. 23 \_\_\_\_\_

Name: \_\_\_\_\_  
Testing Review Part II

Find the square root:

1.  $\sqrt{25}$

2.  $\sqrt{64}$

3.  $\sqrt{100}$

4.  $\sqrt{121}$

5.  $\sqrt{28}$

Give the value of the numbers below:

6.  $7^2$

7.  $4^5$

8.  $(5^1)^4$

9.  $(4^2)^6$

10.  $355^0$

11.  $5^{-2}$

12.  $2^{-4}$

13.  $\frac{1^2}{2}$

14.  $\frac{2^3}{5}$

Multiply:

15.  $2 \times 2^2 =$  \_\_\_\_\_

16.  $3^4 \times 3^3 =$  \_\_\_\_\_

17.  $5^4 \times 5^3 =$  \_\_\_\_\_

18.  $4^2 \times 4^3 =$  \_\_\_\_\_

19.  $2^2 \times 3^2 =$  \_\_\_\_\_

20.  $4^3 \times 3^3 =$  \_\_\_\_\_

Divide:

21.  $\frac{2^3}{2^2} =$  \_\_\_\_\_

22.  $\frac{4^5}{4^3} =$  \_\_\_\_\_

23.  $\frac{6^6}{6^5} =$  \_\_\_\_\_

24.  $\frac{8^7}{8^4} =$  \_\_\_\_\_

25.  $\frac{2^4}{4^2} =$  \_\_\_\_\_



26. 25% of 100 is?

27. 35% of 50 is?

28. 50 is 40% of what number?

29. 20 is 25% of what number?

30. 20 is what percent of 40?

31. 70 is what percent of 200?

Name: \_\_\_\_\_  
Testing Review Part III

Percent Increase/Decrease:

1. What is the percent decrease on a DVD recorder that is marked down from \$400 to \$350?
2. My real estate agent told me that my house had appreciated in value over the last three years. In other words, it has gone from being worth \$102,500 to being worth \$111,000. What is the percent increase in the value of my house?
3. The enrollment at a university increased from 14,000 students to 16,000 students over a period of 5 years. What is the percent increase in enrollment?
4. The selling price of a home was dropped from \$200,000 to \$190,000. By what percent did the price drop?

## Patterns, Relations, & Algebra Review Sheet

### 1. Algebraic Relations:

\*Key Words to know

What it says:

sum

difference

product

quotient

10 more than x

10 less than x

10 is more than x

10 is less than x

What it means:

addition

subtraction

multiplication

division

$x + 10$

$x - 10$

$10 > x$

$10 < x$

### 2. Multiplying Expressions: Use FOIL or Area Models

$$(x + 5)(x - 4)$$

$$(x + 3)(x + 9)$$

### 3. Factoring Expressions: Look at the last term and determine what two numbers multiplied together will give you that answer. You also must be able to add them together so that you get the middle term.

$$x^2 + 12x + 32$$

$$x^2 - 6x - 16$$

### 4. Linear Functions: $y = mx + b$

### 5. Inequalities:

- Graphing inequalities

- When dividing by a negative number switch the inequality sign.

### 6. Quadratic Functions: $y = ax^2 + bx + c$

### 7. Solving Multi-step Equations

Name: \_\_\_\_\_

Testing Review

Patterns, Relations, and Algebra

Multiply each expression:

1.  $(x-2)(x+8)=$  \_\_\_\_\_

2.  $(x+3)(x-5)=$  \_\_\_\_\_

Factor each expression:

3.  $x^2 + 14x + 24$

4.  $x^2 - 10x + 8$

Write an expression for the following phrases:

5. 6 more than Z.

6. 6 is more than Z.

7. 4 less than 2.

8. 2 is less than 4.

9. What is the y-intercept and slope in the following equation?

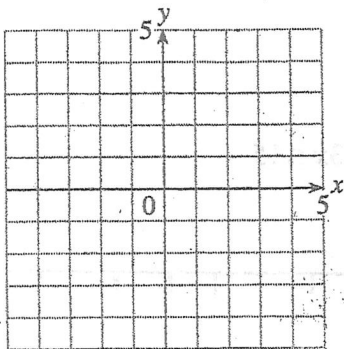
$$Y = \frac{2}{3}x + 5$$

Y-intercept: \_\_\_\_\_

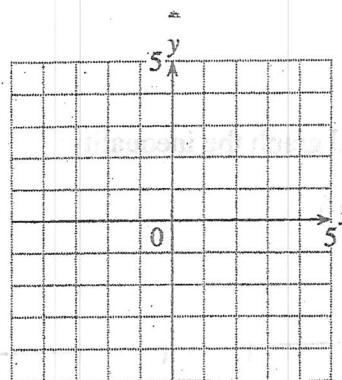
Slope: \_\_\_\_\_

Graph the following equations:

10.  $Y = 2x + 1$



11.  $x + y = 4$

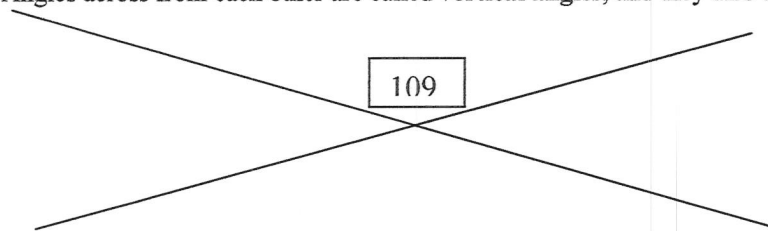


## Geometry Review Sheet

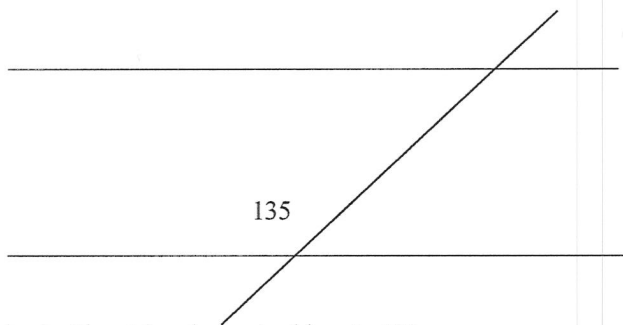
### I. Lines, Angles, & Figures:

\*Angles on a line must add up to 180

\*Angles across from each other are called **vertical angles**, and they also are equal measurements.



\*Relationships of angles when parallel lines are cut by a transversal



\*All angles inside a triangle must add up to 180

\*All angles inside a quadrilateral (4 sided figure) must add up to 360

\*Isosceles Triangles have at least 2 equal sides which means 2 equal angles

\*Scalene Triangles have NO equal sides

\*Equilateral Triangles have all equal sides, and 3 sixty degree angles

\*Polygon: a plane geometric figure with 3 or more line segments that join without crossing one another.

\*Parallelogram: a quadrilateral with opposite sides parallel and equal length

\*Rhombus: A parallelogram with four equal sides, but no 90 degree angles

\*Regular polygons: a polygon with all sides equal and all angles equal

\*Interior angles of a Regular Polygon: use this formula  $\frac{180(N-2)}{N}$       N=# of sides

\*Diagonals of a Polygon: use this formula  $\frac{n(n-3)}{2}$       n= # of sides in polygon

\*Circles:

-Radius is distance from center to side

-Diameter is distance from side to side through the center

-Chord is any line drawn from one side of circle to other (not diameter)

-Arc is any section of the perimeter

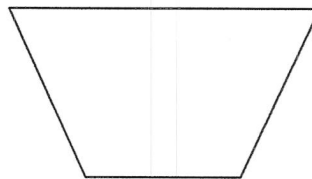
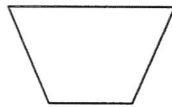
-Circles have 360 degrees in them

-Circumference is distance around circle use  $2 * \pi * \text{radius}$  or  $\pi * \text{Diameter}$

\*Special Triangle Rule: "the third side rule" states that the sum of every two sides of a triangle must be greater than the third side.

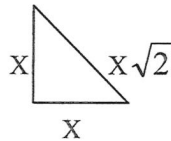
\*Congruent: shapes that are the same size and shape

\*Similar Figures: In order to be similar: 1. the corresponding angles must be equal  
2. corresponding sides ratios are equal

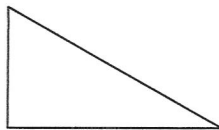


\*Special Triangles:

1. 45-45-90:



2. 30-60-90:



\*Graphing on the coordinate plane: Start at (0,0) move right left, then up down, and plot point.

\*Slope: (Change in Y coordinates) divided by (Change in X coordinates)

\*Parallel Lines have the same slope

\*Perpendicular lines have negative reciprocal slopes

\*Horizontal lines have a slope of zero ( $Y = 5$ )

\*Vertical lines have an undefined slope ( $X = 3$ )

\*Distance between two points on a graph, create a right triangle and use the Pythagorean Theorem. ( $a^2 + b^2 = c^2$ )

\*Translation of a figure: moving a figure up,down, left or right.

\*Reflection: how a figure would look in a mirror if the mirror were placed on the graph

\*Rotation: turns a figure a set number of degrees about a specified point

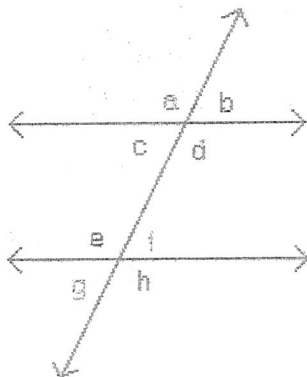
\*Scale Factor: Enlarges or Shrinks a figure by a fixed amount

Name: \_\_\_\_\_  
 Testing Review  
 Geometry

Use the diagram below to answer questions 1-

1. Name a pair of alternate interior angles.
2. Name a pair of alternate exterior angles.
3. Name a pair of corresponding angles.
4. Name a pair of vertical angles.
5. Name a pair of supplementary angles.
6. Given that Angle A = 75; what is the measure of the remaining angles B-H.

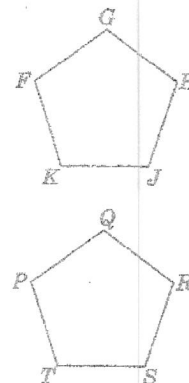
B= \_\_\_ C= \_\_\_ D= \_\_\_ E= \_\_\_ F= \_\_\_ G= \_\_\_ H= \_\_\_



7. The interior angles of the diagram below equal= \_\_\_\_\_
8. The diagonal of the diagram below equals= \_\_\_\_\_

Pentagon  $FGHJK$  is congruent to pentagon  $PQRST$ . Name the corresponding parts of the pentagons. The first one is done for you.

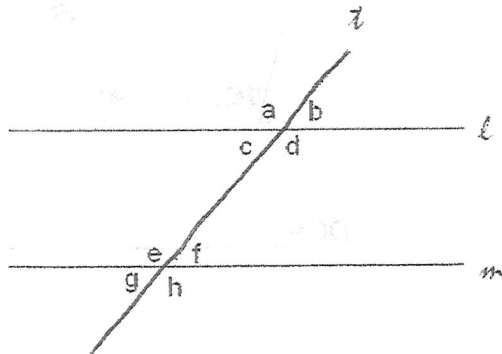
9.  $\overline{FG} \cong \overline{PQ}$
10.  $\overline{HJ} \cong$  \_\_\_\_\_
11.  $\overline{TP} \cong$  \_\_\_\_\_
12.  $\angle G \cong$  \_\_\_\_\_
13.  $\angle S \cong$  \_\_\_\_\_
14.  $\overline{GH} \cong$  \_\_\_\_\_
15.  $\overline{ST} \cong$  \_\_\_\_\_
16.  $\angle F \cong$  \_\_\_\_\_
17.  $\angle R \cong$  \_\_\_\_\_
18.  $\angle K \cong$  \_\_\_\_\_



Name: \_\_\_\_\_

### Geometry Review Quiz

Find the measures of the angles using the information given.



$l \parallel m$

$\angle a = 85^\circ$	$\angle e = 85^\circ$
$\angle b = \underline{\hspace{2cm}}$	$\angle f = \underline{\hspace{2cm}}$
$\angle c = \underline{\hspace{2cm}}$	$\angle g = \underline{\hspace{2cm}}$
$\angle d = \underline{\hspace{2cm}}$	$\angle h = \underline{\hspace{2cm}}$

Find the circumference of a circle using the information given.

8.  $R=3$  Circumference = \_\_\_\_\_

9.  $D=18$  Circumference = \_\_\_\_\_

Find the area of a circle using the information give.

10.  $D=20$  Area = \_\_\_\_\_

Find the radius of a circle using the information given.

11. Area =  $64\pi$  Radius = \_\_\_\_\_

Find the slope using the given information.

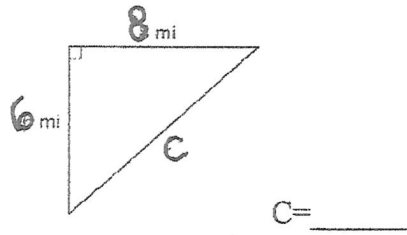
12.  $(6, 4), (5, 2)$

13.  $(-3, -2), (4, 3)$



Use the Pythagorean Theorem to solve for the missing side.

21.



22. A 20 foot ladder is leaned against a wall. If the base of the ladder is 8 feet from the wall, how high up the wall will the ladder reach?

that appear twice are only listed once.

4<sup>th</sup>: Draw a box whose ends go through the points for the 1<sup>st</sup> & 3<sup>rd</sup> Quartiles.

5<sup>th</sup>: Draw a vertical line through the box at the point representing the median.

6<sup>th</sup>: Draw the whiskers from each end of the box to the smallest & largest number.

VIII. Circle Graphs: show parts of a whole relationship

IX: Line Graphs: x-axis has numbers for periods of time (days, months, years)  
y-axis indicates a number for what is being shown

X: Probability: the chance that an event will happen, and is given as a fraction between 0 and 1.

0 means it will never happen. 1 means it will definitely happen.

$$\text{Probability} = \frac{\text{Number of Desired outcomes}}{\text{Total Possible outcomes}}$$

Probability of separate individual events:

Rolling a Die twice and getting a 5:

XI: Combinations: problems ask you how many different ways a number of things can be chose or combined.

\*Remember the number of combinations is the product of the different number of things you have to choose from.

*Statistics & Probability*  
Review Sheet

I. Setting up proportions to solve sampling question

example: Alex found 5 pounds of peanuts in a 23 pound bag of candy.  
Approximately how many pounds of peanuts would you expect to find in 105 pounds of the same candy.

II. Populations & Samples:

Population: a complete set of objects or persons that have a common characteristic.

Sample: The selected objects or persons chosen for participation in a study.

III. Measures of Central Tendency:

Mean: Add each item, and divide by how many you have

Median: Put numbers in order, and then find the middle.

If you have 2 middle numbers, you must add them & divide by 2.

Mode: The number that appears the most

Range: The difference between the high & low numbers.

IV. Line of Best Fit:

\*Line of best fit is the straight line that can be drawn through or near to as many data points as possible on a scatterplot.

V. Scatterplot: a graph that shows the relationship between two variables

Positive Correlation: As x increases so does y

Negative Correlation: As x increases, y decreases.

VI. Stem-and-Leaf Plot:

Leaf: Usually the last digit of the number

Stem: The remaining digits to the left of the last digit

VII. Box & Whisker Plot:

The **median** of the data set separates the data into 2 equal parts.

Data can be separated into **quartiles**.

The 1<sup>st</sup> quartile is the median of the lower part of the data.

The 3<sup>rd</sup> quartile is the median of the upper part of the data.

**Quartiles** are separators of the data set into 4 equal parts.

Example:

Put the following test scores into a box-and-whisker plot

80, 75, 90, 95, 65, 65, 80, 85, 70, 100

1<sup>st</sup>: Put them in order

2<sup>nd</sup>: Decide which numbers represent the 1<sup>st</sup> quartile, median, 3<sup>rd</sup> quartile, the smallest number, and the largest number.

3<sup>rd</sup>: Place a dot beneath each of the values on a number line. Numbers

Name: \_\_\_\_\_  
Probability & Statistics Review Sheet

Proportions

1. There are 35 fish in a pond that has 200 gallons of water. How many fish would you expect to find in a pond that has 1000 gallons of water?

Mean, Median, Mode, Range

2. Bonnie went to the grocery store to buy some soda pop. She noticed that different brand's cans contained varying amounts of pop. GatorDew cans contain 355 milliliters, SweetCola came in 360 milliliter cans, OkraCola was sold in 352 ml cans, and SugarUp came in 357 ml cans. What was the average size the four cans?

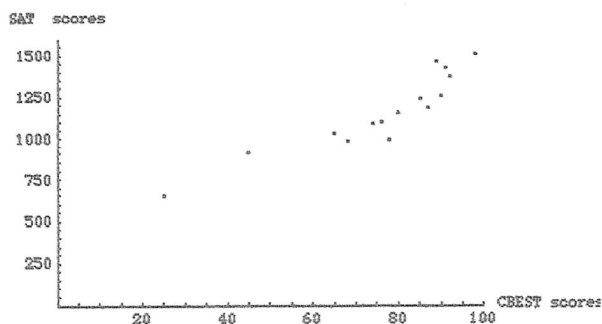
3. Hans checked the temperature in his apple orchard at 10:00 P.M. His thermometer read 37°F. Hans kept checking his thermometer every hour for the next 8 hours and got these readings: 37°, 35°, 33°, 32°, 30°, 30°, 29°, and 30°. What was the median temperature during this 8 hour period?

4. The following is the number of problems that Ms. Matty assigned for homework on 10 different days. What is the mode?  
8, 11, 9, 14, 9, 15, 18, 6, 9, 10

5. Cheryl took 7 math tests in one marking period. What is the range of her test scores?  
89, 73, 84, 91, 87, 77, 94

Line of Best Fit

6. Draw the Line of Best Fit on the graph below.



### Box and Whisker Plot

Create a box and whisker plot using the information below and by answering questions 10 -20.

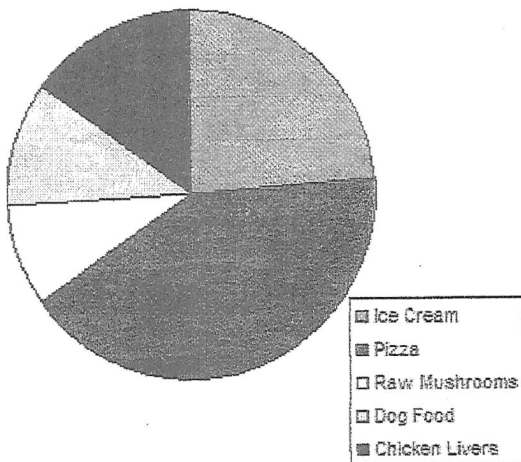
The following set of numbers are the amount of marbles fifteen different boys own (they are arranged from least to greatest).

**18 27 34 52 54 59 61 68 78 82 85 87 91 93 100**

10. What is the smallest number in our set? \_\_\_\_\_
11. What is the largest number in our set? \_\_\_\_\_
12. What is the median? \_\_\_\_\_
13. What are the numbers in the first quartile? \_\_\_\_\_
14. What is the median of the first quartile? \_\_\_\_\_
15. What are the numbers in third quartile? \_\_\_\_\_
16. What is the median of the third quartile? \_\_\_\_\_
17. Now plot the answers to questions 10,11,12,14, & 16 below their value on the number line. (make your # line by 10's)
  
18. Draw a box whose ends go through the points for the 1<sup>st</sup> quartile and the 3rd quartiles in your graph above.
19. Draw a vertical line through the box at the point representing the median.
20. Draw the whiskers from each end of the box to the smallest and largest numbers.

### Circle Graphs

Interpret the Graph below by answering questions 21-23.



*Favorite Foods of Room 121*

21. What percentage of students chose pizza as their favorite food? \_\_\_\_\_
22. What food did about 25% of the students choose as their favorite? \_\_\_\_\_
23. What percentage of students chose raw mushrooms as their favorite food? \_\_\_\_\_

### Line Graphs

Determine what information should go on the x-axis and what information should go on the y-axis.

24. A graph is created that shows the increase in the minimum wage in the United States from 1977-2007.

What information belongs on the x-axis? \_\_\_\_\_

What information belongs on the y-axis? \_\_\_\_\_

### Probability

Paul has 1 green shirt, 5 red shirts, and 9 striped shirts. He randomly draws one out of his drawer.

25. What is the probability that the shirt is green? \_\_\_\_\_
26. What is the probability that the shirt is not striped? \_\_\_\_\_

### Probability of individual events

27. If you roll 2 number cubes, each with faces numbered 1 to 6, what is the probability that you will roll 2 sixes?

### Combinations

You are a coach for a baseball team and you must choose a new uniform for your team. The company tells you to choose from 3 different colored shirts, 5 different colors of shorts and 2 pairs of striped socks. How many different uniform combinations do you have to choose from?

Name: \_\_\_\_\_  
MCAS Review

1. If  $2n - 3 = -15$  then  $n$  equals?

2. If  $3(2r - 5) = 27$  then  $2r - 5$  equals ?

3. What is the missing term in the quadratic equation below?

$$(2x - 3)(x + 4) = 2x^2 + \underline{\hspace{2cm}} - 12$$

4. Solve the following equations for  $x$ .

$$0.5(x - 8) = 0.2x + 11$$

5. A fast growing strain of bacteria doubles in population every 20 minutes. A laboratory has a culture of 200 of these bacteria cells. The function below can be used to find  $p$ , the number of bacteria cells in this culture after  $t$  hours.

$$p = 200(8^t)$$

What is the total number of bacteria cells after 2 hours?

6. A laboratory has a 75-gram sample of a radioactive material. The half-life of the material is 10 days. (This means that it takes 10 days for half of the initial mass to decay.) The formula below can be used to find  $m$ , the remaining mass in grams, in terms of  $t$ , the number of 10 day intervals the mass has been decaying.

$$M = 75(0.5)^t$$

Based on the formula, what is the mass of the laboratory's sample remaining after 30 days?

**HINT:**

Let's start by determining which value of  $t$  we must substitute into the equation  $m = 75(0.5)^t$  in order to find  $m$ . What is the value of  $t$  for 30 days?

Now use the  $t$  you found to determine the mass after 30 days. What is the mass after 30 days?

7.  $10\%$  of  $120 = ?$

8.  $t(x) = 4 + 3x$   
 $r(x) = 12 - 2x$   
 $j(x) = 7x - 11$

What is  $j(3)$ ?

What is  $r(-3)$ ?





**2004, Mathematics - Grade 10**  
**Question 17: Open Response**  
**Number Sense and Operations**

Each of the statements below is true for particular values of real numbers  $p$ ,  $t$ ,  $v$ , and  $z$ .

$$v \cdot p = v \text{ and } v \neq 0$$

$$8 \cdot z = p$$

$$v + 5 = t$$

$$t + p = p$$

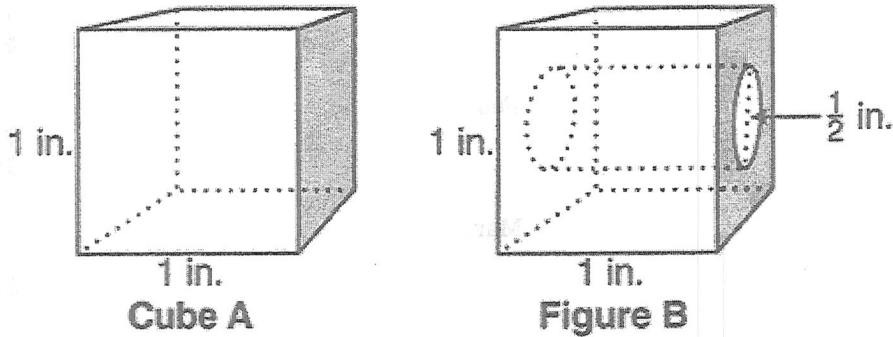
- What is the numerical value of  $p$ ? Write the equation or equations you used to find its numerical value and explain your reasoning.
- What is the numerical value of  $t$ ? Write the equation or equations you used to find its numerical value and explain your reasoning.
- What is the numerical value of  $v$ ? Write the equation or equations you used to find its numerical value and explain your reasoning.
- What is the numerical value of  $z$ ? Write the equation or equations you used to find its numerical value and explain your reasoning.

**2003, Mathematics - Grade 10**  
**Question 31: Open Response**  
**Number Sense and Operations**

An art collector paid \$7,000 for two paintings, a portrait and a landscape, at the same auction. Each painting cost \$3,500.

- The collector predicts that the portrait will increase in value by \$600 per year. If she is correct, how many years after the date of purchase will the value of the portrait painting first be at least twice its original cost? Show or explain how you obtained your answer.
- Two years after the date of purchase, the portrait was appraised at \$4900. What was the percent of increase from the collector's purchase price to the appraised value? Show or explain how you obtained your answer.
- The collector predicts that the value of the landscape painting will increase by 15% per year. If she is correct, what will its value be one year after the date of purchase? Show or

to two opposite faces of the original cube, as shown in the diagram.



- What is the total surface area of Cube A?
- What is the total surface area of Figure B? Show your work or explain how you obtained your answer.

**2001, Mathematics - Grade 10**  
**Question 21: Open Response**  
**Number Sense and Operations**



Ms. Kemay started a small computer software business seven months ago. The following spreadsheet shows her income and expenses for each of the seven months.

**Kemay Computer Software**

**Month**

**Income**

**Expenses**

Sept.

\$7,550

\$9,700

Oct.

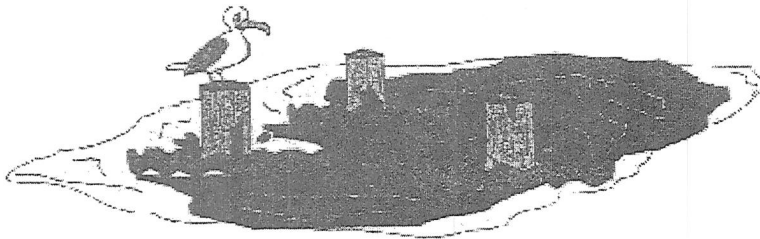
\$9,500

\$10,250

Explain or show how you found your answer.

c. Suppose the value of another car, which also costs \$18,000, decreases at the rate of 25% each year. Which car would have the greater value 3 years after it was purchased? Explain or show how you found your answer.

**1999, Mathematics - Grade 10**  
**Question 22: Open Response**  
**Number Sense and Operations**



A company is hired to clean up an oil spill in a harbor. Each day 10% of the remaining oil can be cleaned from the surface of the water.

- What percent of the oil will remain after one clean-up day?
- What percent of oil will remain after 3 clean-up days? Explain or show how you found your answer.
- How many clean-up days will it take to remove at least 50% of the oil spill? Explain or show how you found your answer.

**1998, Mathematics - Grade 10**  
**Question 34: Open Response**  
**Number Sense and Operations**

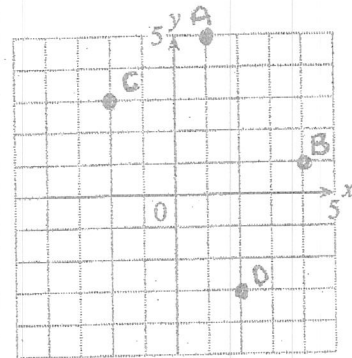
Students in a 10th-grade math class have arranged the natural numbers in a spreadsheet. Maria's group starts by arranging the numbers in the table below.

Name: \_\_\_\_\_

### Distance and Midpoint Formula Quiz

1. Find the distance between points A and B.

2. Find the midpoint between points C and D.



Find the distance between the following points.

3.  $(2, 7), (5, 3)$

4.  $(1, 3), (7, 11)$

5.  $(9, 3), (12, -1)$

Find the midpoint between the following points.

6.  $(6, 1), (-2, 5)$

7.  $(5, 2), (3, 4)$

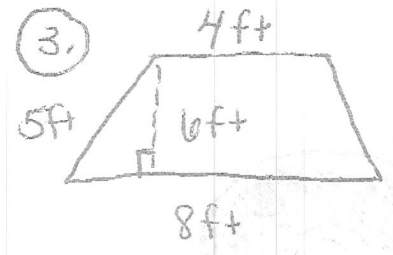
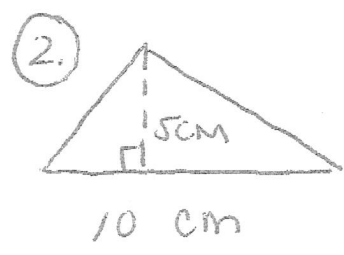
8.  $(9, 13), (3, -1)$

9. A runner starts at point  $(-5, -7)$  and a walker starts at point  $(3, 3)$  and they want to meet at the lake to take a swim which is located at the midpoint between each of their starting locations; at what point is the lake located?

10. A child on a bike starts peddling from his driveway (the origin) or  $(0, 0)$  and travels 7km north to the end of his driveway. He then travels from the end of his driveway east (positive direction) 10km to his friend's house. What is the distance between the end of his driveway and his friend's house?

Name: \_\_\_\_\_

# Area and Circumference Quiz



Use the diagram below to answer # 4-7

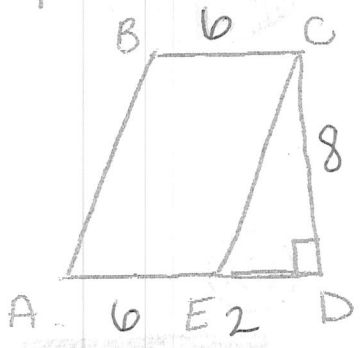
④ Find the area of parallelogram ABCE.

\_\_\_\_\_

⑤ Find the area of triangle CDE.

\_\_\_\_\_

⑥ Find the area of trapezoid ABCD.



\_\_\_\_\_

⑦ The area of a triangle is  $48\text{cm}^2$ . Find the height of the triangle if the base is 8cm. \_\_\_\_\_

Find the circumferences. Round to the nearest tenth.

⑧  $r = 10$  \_\_\_\_\_

⑨  $d = 6$

Find the area. Round to the nearest tenth.

⑩  $r = 7$  \_\_\_\_\_

⑪  $d = 12$  \_\_\_\_\_