

# UNIT 10

## COORDINATE PLANE

### CCM6+ 2015-16

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

Math Teacher: \_\_\_\_\_

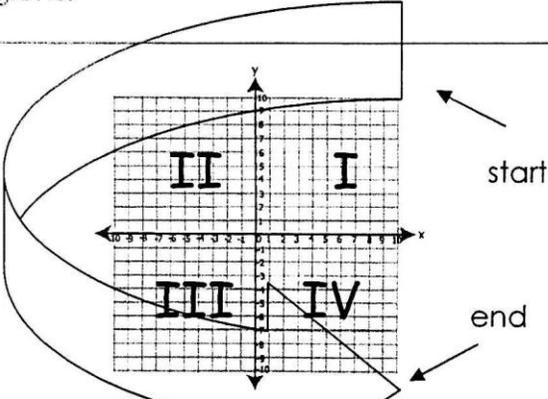
Projected Test Date: \_\_\_\_\_

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**Unit 10: Coordinate Plane**

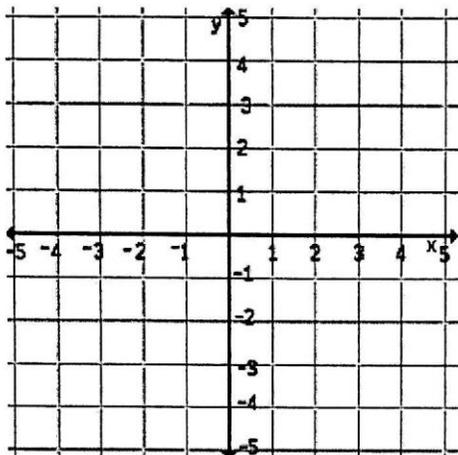
coordinate plane	A plane formed by the intersection of the x-axis and the y-axis.
x-axis	The horizontal number line
y-axis	The vertical number line
quadrants	The x- and y-axes divide the coordinate plane into four regions. Each region is called a quadrant.
origin	The point where the x-axis and y-axis intersect on the coordinate plane.
ordered pairs	A pair of numbers that can be used to locate a point on a coordinate plane.
x-coordinate	The first number in an ordered pair; it tells the distance to move right or left from the origin.
y-coordinate	The second number in an ordered pair; it tells the distance to move up or down from the origin.
reflection	a transformation of a figure that flips the figure across a line
integers	The set of whole numbers and their opposites.
opposites	Two numbers that are equal distance from zero on the number line.
absolute value	The distance of a number from zero on a number line; shown by the symbol: $  \quad  $

## Coordinate Graphing Notes

Question	Answer
What is a <b>coordinate plane</b> ?	Two _____ and _____ number lines connected at _____.
What is the <b>X axis</b> ?	The _____ axis on a coordinate plane.
What is the <b>Y axis</b> ?	The _____ axis on a coordinate plane.
What is the <b>Origin</b> ?	The _____ point; where the X and Y axis intersect. (____, ____)
What is an <b>Ordered Pair or Coordinate Points</b> ?	Two points, one for the X axis and one for the Y axis, used to locate an exact location. ( X axis, Y axis ) ( 5 , 7 ) 5 is the ____-coordinate 7 is the ____-coordinate
What is a <b>Quadrant</b> ?	The X and Y-axes divide the coordinate plane into four regions.
What are the <b>4 Quadrants</b> of a coordinate plane?	<div style="text-align: center;">  </div> <p>* Starting in the upper right hand corner, the quadrants are numbered 1-4 going COUNTER CLOCKWISE.</p> <p>* We use Roman Numerals to identify each quadrant (1-4)</p> <p>The letter "C" is drawn in the order of the quadrants: start at top right, curve around and end bottom right.</p>

## Coordinate Graphing Notes

How do I identify the exact location of a point?



- 1.) Start at zero. Move left or right based on the value of the x-coordinate.
- 2.) From there, go up or down based on the value of the y-coordinate.
- 3.) Make a dot and put the letter beside it.

\*\* Remember, you must find the x value first (x comes before y in the alphabet)

**Practice—Graph the following points and tell the location on the coordinate plane.**

A(-2, 4)    B(3, 0)    C(2, -4)    D(0, -1)  
 Q\_\_\_\_\_    \_\_\_\_\_axis    Q\_\_\_\_\_    \_\_\_\_\_axis

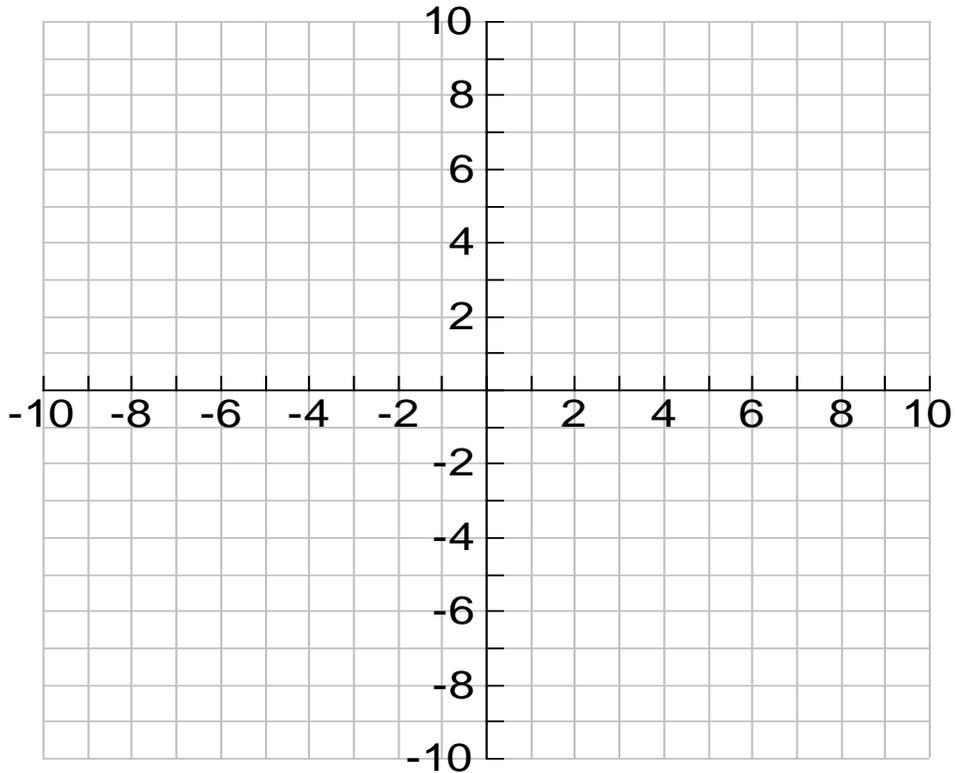
E(-5, -5)    F(1, -1)    G(-3, -1)    H(\_\_\_\_, \_\_\_\_)  
 Q\_\_\_\_\_    Q\_\_\_\_\_    Q\_\_\_\_\_    Q II

### REVIEW of Coordinate Planes: Plotting Points on a Coordinate Grid

Questions	Answers
Name a point in Q I.	
Name a point in Q II.	
Name a point in Q III.	
Name a point in Q IV.	
Name a point on the x-axis.	
Name a point on the y-axis.	
The only point on both axes:	
The letter of the alphabet that shows the "order" of the quadrants.	
Explain how to graph (-2, 3) if you start at the origin.	Start at _____. Move _____ spaces to the _____. Move _____ spaces _____.

## Work It Out: The Cartesian Plane and Coordinates

1.



Label the axes.

2. A coordinate is written in the form: ( \_\_\_\_\_ , \_\_\_\_\_ )

3. Graph the following coordinates on the plane above:

A. (-6, 2) B. (0, 8) C. (-10, 5) D. (3, -7)

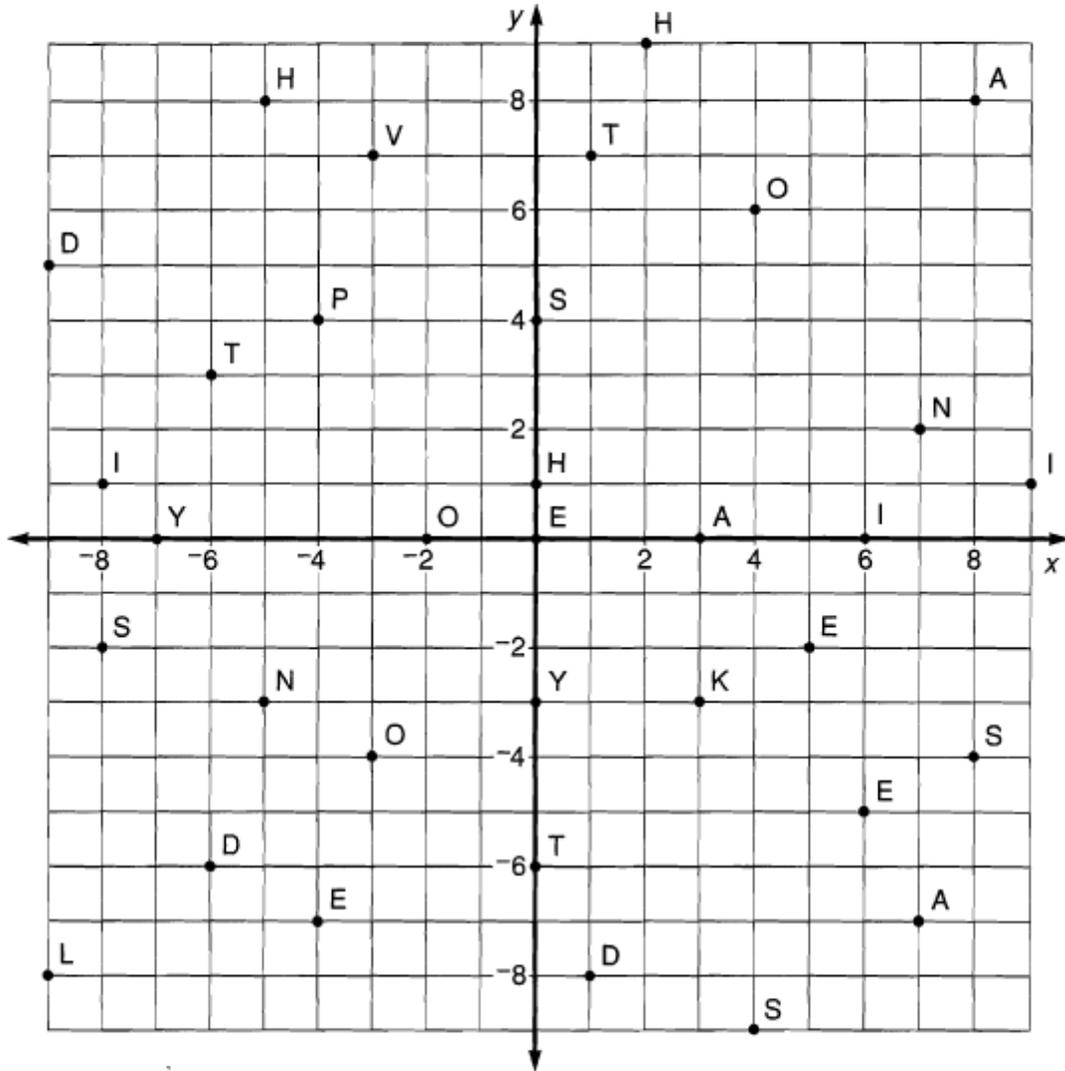
E. (9, 3) F. (4, 0) G. (9, -9) H. (-2, -8)

4. Label the quadrants.

5. Label the origin - the ordered pair is ( \_\_\_\_\_ , \_\_\_\_\_ )

## Why Is a Mother Kangaroo Unhappy When It Rains?

Each ordered pair at the bottom of the page represents a point on the coordinates below. Above each ordered pair, write the letter that appears at that point.



(4,6) (7,2) (-6,3) (-5,8) (-3,-4) (-8,-2) (6,-5) ( I , ) (3,0) (-7,0) (0,4)

(0,-6) (2,9) (-4,-7) (3,-3) ( I ) (-6,-6) (4,-9) (0,1) (8,8) (-3,7) (5,-2)

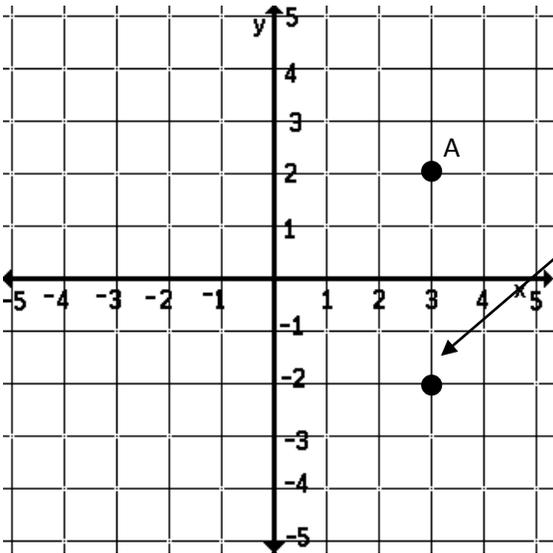
                                                                                                                        

(1,7) (-2,0) (-4,4) (-9,-8) (7,-7) (0,-3) (9,1) (-5,-3) (8,-4) (6,0) (-9,5) (0,0)

## Guided Reflection Notes

### Reflecting a point over the $x$ - or $y$ -axis

#### Reflecting over the $x$ -axis:



Write down the ordered pair for A.

If A is reflected across the  $x$ - axis, what would be the new point on the graph?

Label this point.

Look at both points, what observations can you make about the two points.

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Reflecting over the  $x$ -axis rule:

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Try it:

Graph the following points in the correct quadrant of the coordinate plane. If the point is reflected across the  $x$ -axis, what are the coordinates of the reflected points? What similarities are between coordinates of the original point and reflected point?

A  $(-5, 2) \longrightarrow ( \quad , \quad )$

B  $(2, 4) \longrightarrow ( \quad , \quad )$

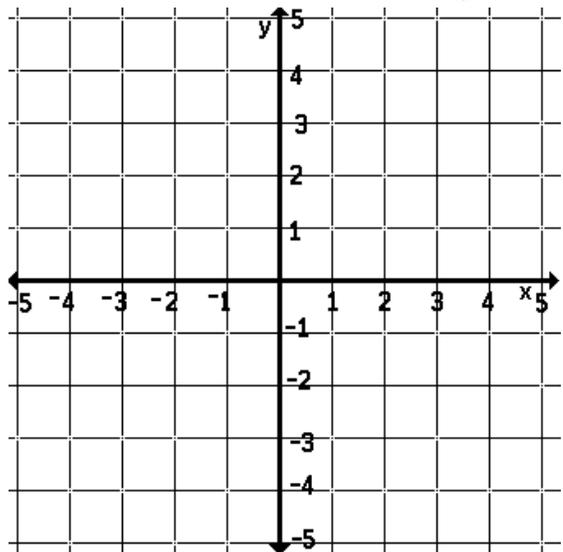
C  $(-1\frac{1}{2}, 3) \longrightarrow ( \quad , \quad )$

D  $(-4, -3\frac{1}{2}) \longrightarrow ( \quad , \quad )$

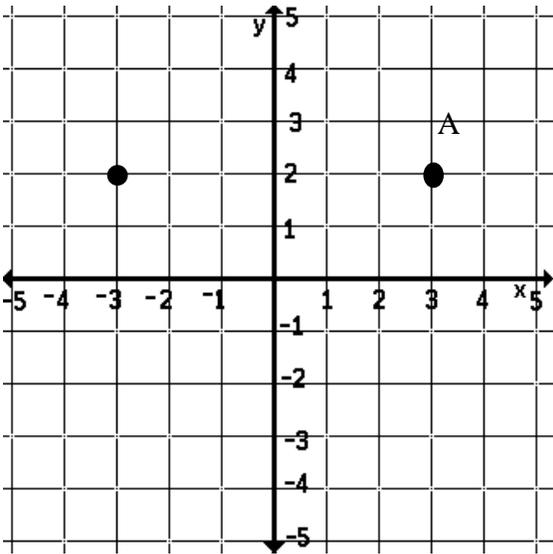
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**Reflecting over the y-axis:**



Write down the ordered pair for A.  
 If A is reflected across the y- axis, what  
 would be the new point on the graph?  
 Label this point.

Look at both points, what observations  
 can you make about the two points.

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Reflecting over the y-axis rule:

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Try it:

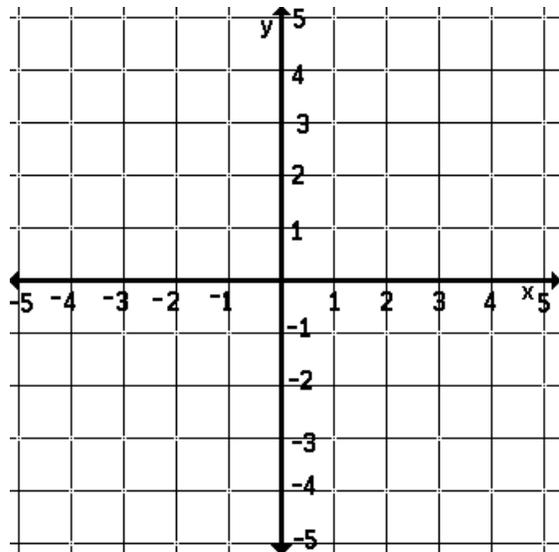
Graph the following points in the correct quadrant of the coordinate plane.  
 If the point is reflected across the y-axis, what are the coordinates of the  
 reflected points? What similarities are between coordinates of the original  
 point and reflected point?

- A  $(-5, 2)$        $\longrightarrow$        $( \quad , \quad )$
- B  $(2, 4)$        $\longrightarrow$        $( \quad , \quad )$
- C  $(-1\frac{1}{2}, 3)$        $\longrightarrow$        $( \quad , \quad )$
- D  $(-4, -3\frac{1}{2})$        $\longrightarrow$        $( \quad , \quad )$

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What do you think happens to the following point if it starts at  $(2, -4)$  and  
 ends at  $(-2, 4)$ ?

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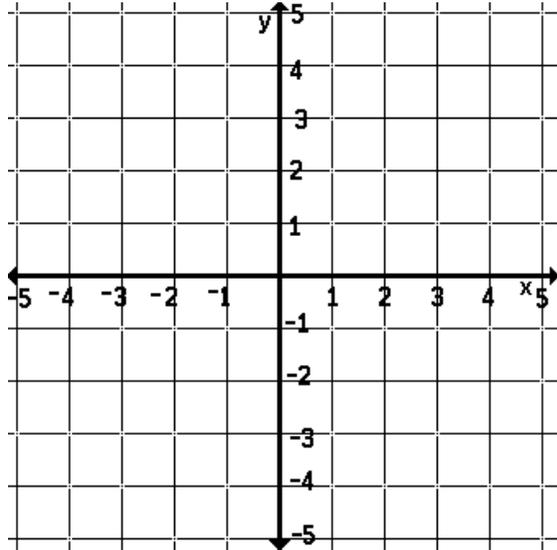


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**Reflection Practice**

1. Graph the following points and then reflect them across the  $x$ -axis.

- M (-2, 1)
- N (-2, 3)
- O (1, 3)
- P (1, 1)



After reflecting the points what kind of observations can you make about the points?

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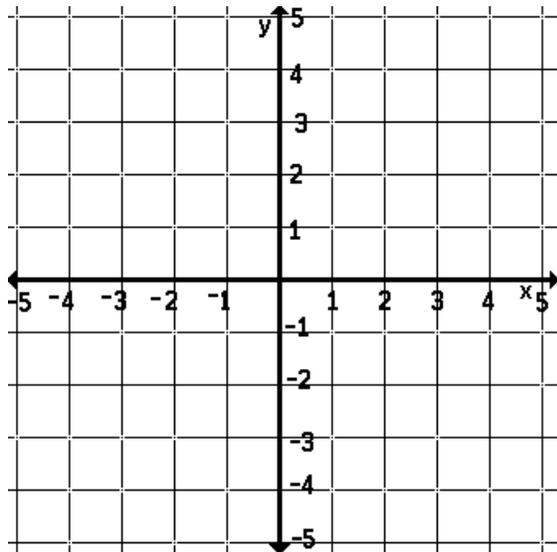
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2. Graph the following points and then reflect them across the  $y$ -axis.

- Q (5, 5)
- R (4, 3)
- S (3, 5)



After reflecting the points what kind of observations can you make about the points?

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3. Identify whether the point has been reflected over the x- or y-axis.

<b>Point</b>	<b>Reflection</b>	<b>Axis</b>
T (3, -2)	T (-3, -2)	
U (6, -2)	U (6, 2)	
V (6, -6)	V (-6, -6)	
W (3, -6)	W (-3, -6)	

4. How do you know if a point was reflected over the x-axis?

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5. What is the difference between reflecting over the x-axis and the y-axis? Are there any similarities? Explain.

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6. If (8, -5) was reflected over both axes, what is the new ordered pair? \_\_\_\_\_

7. What is the rule for crossing over both axes?

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## Taking it a step further...

8. Graph the following coordinates and connect each point:

A (-3, 2)

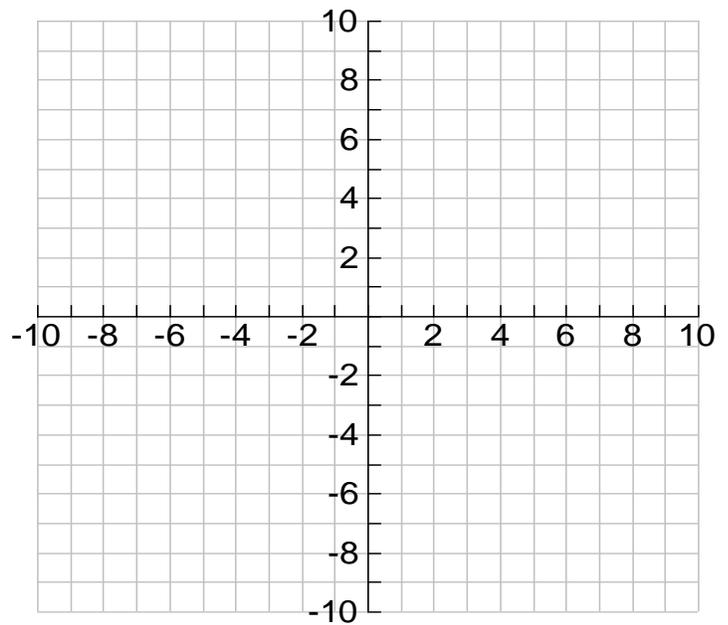
B (-6, 2)

C (-6,-2)

D (-3,-2)

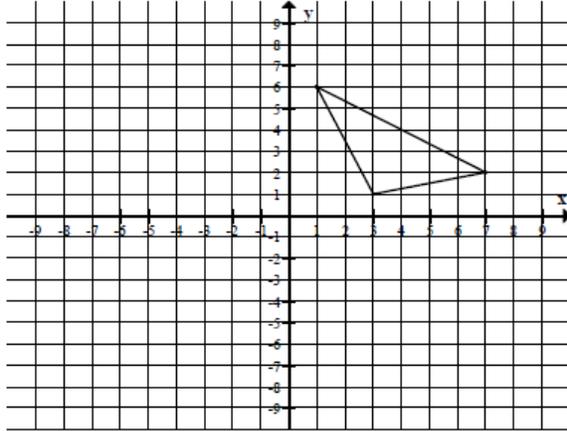
Describe the figure shown.

Reflect the object across the y-axis.

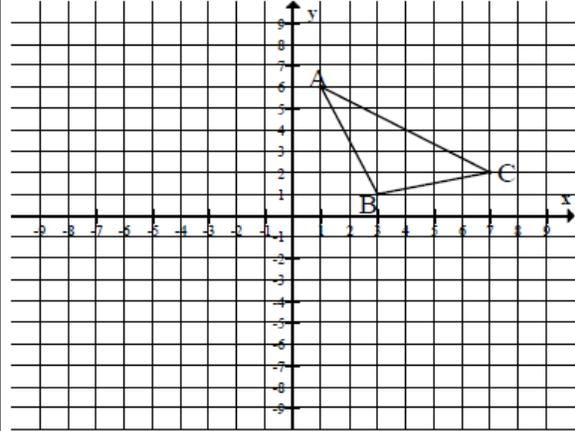


Reflections Worksheet

1. Give the coordinates of ABC. Reflect over the y-axis. Then give the coordinates of A'B'C'



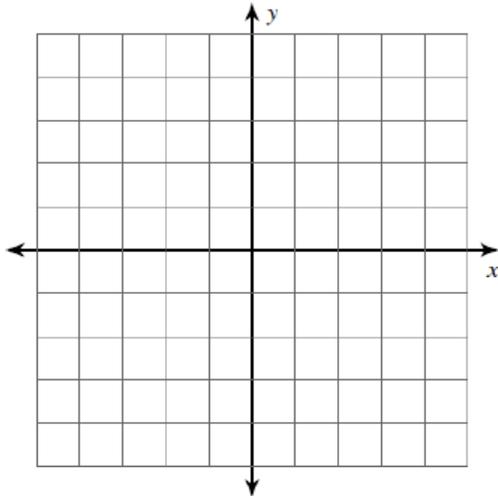
2. Give the coordinates of ABC. Reflect over the x-axis. Then give the coordinates of A'B'C'



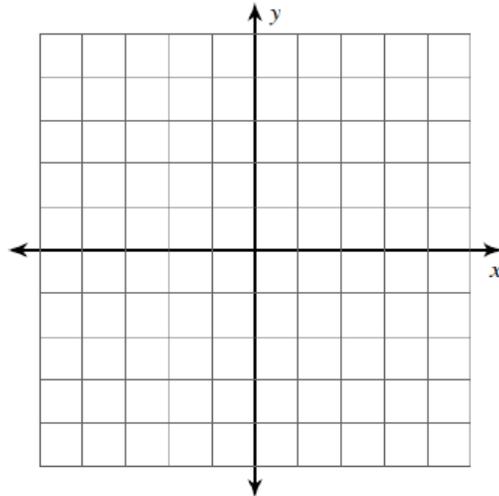
1.  
 A (    )    A' (    )  
 B (    )    B' (    )  
 C (    )    C' (    )

2.  
 A (    )    A' (    )  
 B (    )    B' (    )  
 C (    )    C' (    )

3. Plot  $E(-4,-3)$ ,  $F(-4,-1)$ ,  $G(0,-2)$ . Reflect across the x-axis. Give the coordinates of E'F'G'.



4. Plot  $A(1, 0)$ ,  $B(0, 3)$ ,  $C(1, 3)$ ,  $D(4, -1)$ . Reflect across the y-axis. Give the coordinates of A'B'C'D'.



3.  
 E' (    )  
 F' (    )  
 G' (    )

4.  
 A' (    )  
 B' (    )  
 C' (    )  
 D' (    )

**Find the coordinates of the vertices of each figure after the given transformation.**

1) Reflection across the x-axis

$F(-5, -3), R(-3, 0), N(0, -1)$

$F' ( \quad ) \quad R' ( \quad ) \quad N' ( \quad )$

6) Reflection across the x-axis

$X(1, 0), K(4, 1), T(5, -3)$

$X' ( \quad ) \quad K' ( \quad ) \quad T' ( \quad )$

2) Reflection across the x-axis

$B(-2, 1), S(-2, 2), R(3, 3), J(2, -2)$

$B' ( \quad ) \quad S' ( \quad ) \quad R' ( \quad ) \quad J' ( \quad )$

7) Reflection across the y-axis

$R(-1, 0), L(-1, 1), X(3, -1), D(1, -3)$

$R' ( \quad ) \quad L' ( \quad ) \quad X' ( \quad )$

$D' ( \quad )$

3) Reflection across the x-axis

$M(0, -1), S(3, 2), Q(5, -3)$

$M' ( \quad ) \quad S' ( \quad ) \quad Q' ( \quad )$

8) Reflection across the x-axis

$W(0, 2), F(1, 5), E(4, 3), R(3, 0)$

$W' ( \quad ) \quad F' ( \quad ) \quad E' ( \quad )$

$R' ( \quad )$

4) Reflection across the y-axis

$V(3, -5), E(1, -2), F(3, 0), M(5, -2)$

$V' ( \quad ) \quad E' ( \quad ) \quad F' ( \quad ) \quad M' ( \quad )$

9) Reflection across the x-axis

$U(4, 2), V(2, 4), N(5, 4)$

$U ( \quad ) \quad V' ( \quad ) \quad N' ( \quad )$

5) Reflection across the y-axis

$B(1, 3), H(4, 4), D(4, -1)$

$B' ( \quad ) \quad H' ( \quad ) \quad D' ( \quad )$

10) Reflection across the y-axis

$J(-1, -3), A(-1, -1), P(0, 0)$

$J' ( \quad ) \quad A' ( \quad ) \quad P' ( \quad )$

Geometry G

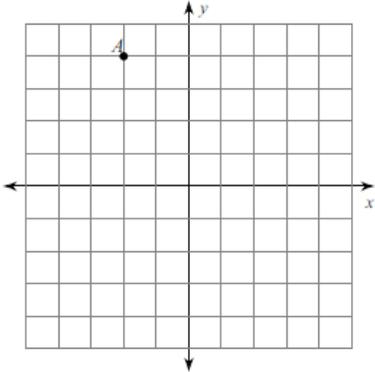
Name \_\_\_\_\_

Reflections Worksheet 1

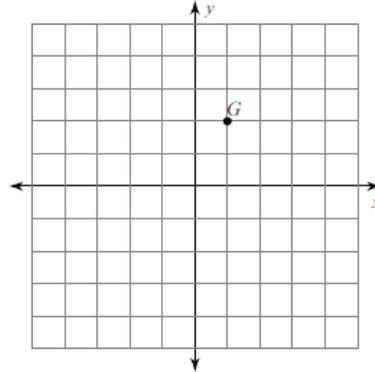
Date \_\_\_\_\_

Find the coordinates of the vertices of each figure after the given transformation.

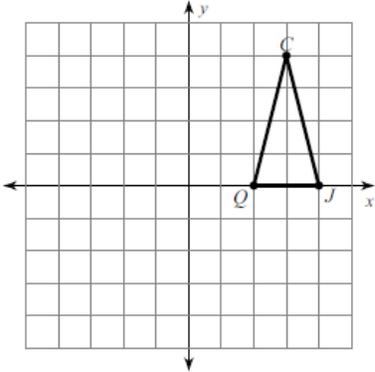
1) reflection across the y-axis



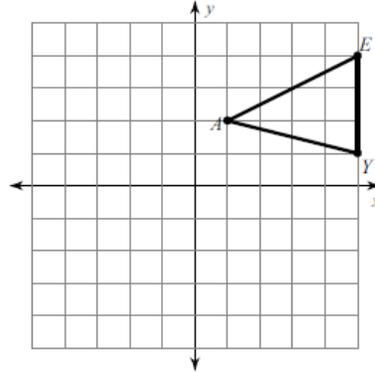
2) reflection across the x-axis



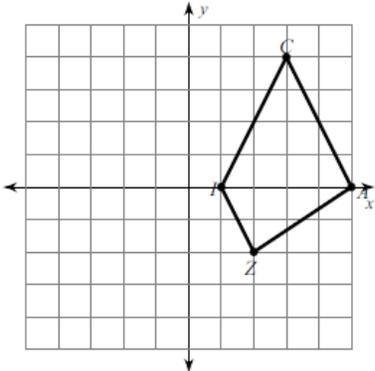
3) reflection across the y-axis



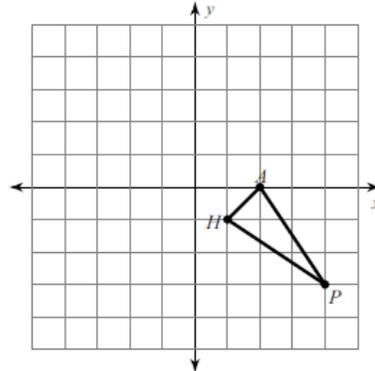
4) reflection across the x-axis



5) reflection across the y-axis



6) reflection across the x-axis



## Absolute Value Warm-up

What is the definition of absolute value?

Why would you use the absolute value of a number?

### Complete the following problems:

What is the opposite of 4?

What is the absolute value of 4?

Find the absolute value of the following numbers:

$|6|$

$|-7|$

$|-10|$

### Challenge:

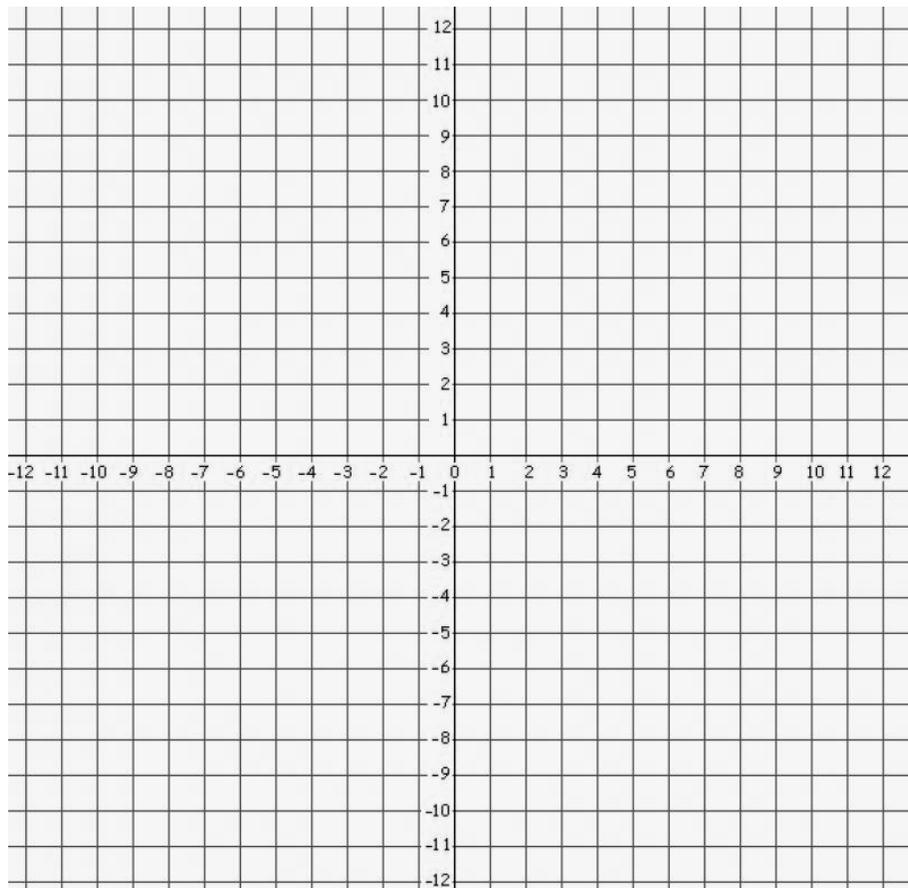
$-|-8|$

# Absolute Value Inquiry Question

Look at the two ordered pairs below, how would you figure out the distance between them?

$(8, 6)$  and  $(8, -6)$

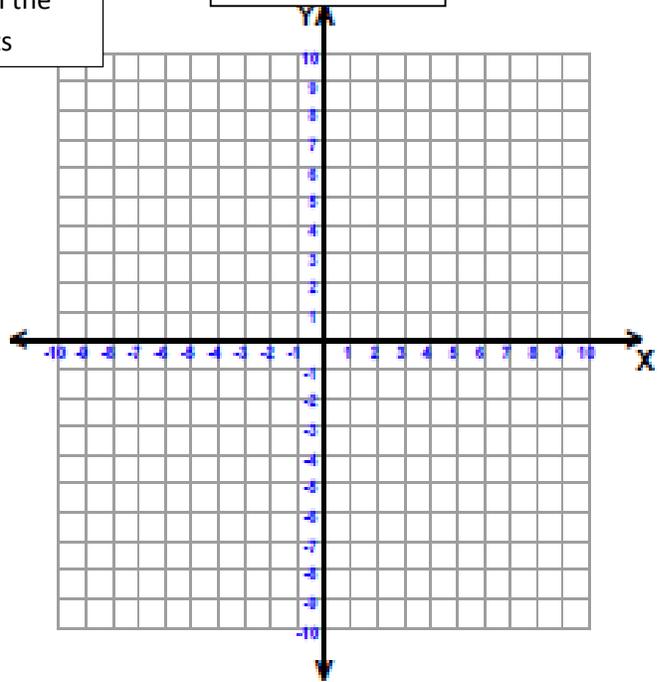
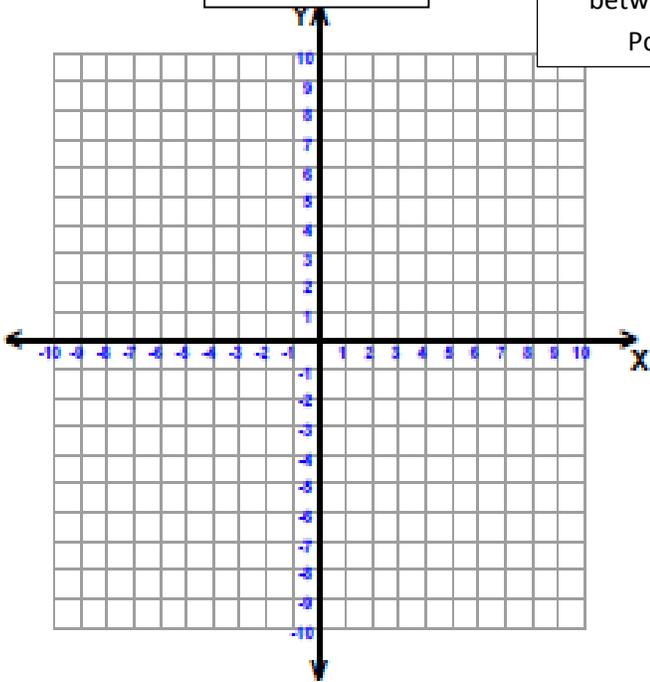
Work with a partner to come up with your solution. Be ready to explain or demonstrate your findings.



(5, 3) and (5, 8)

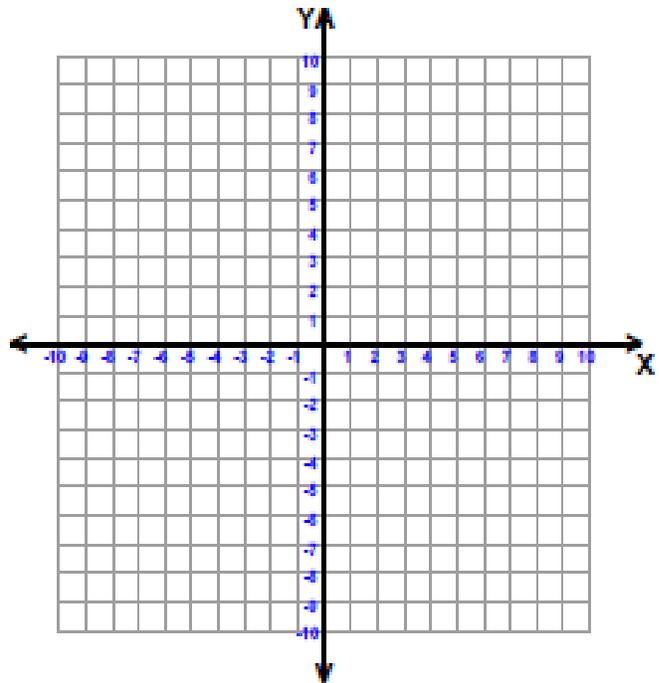
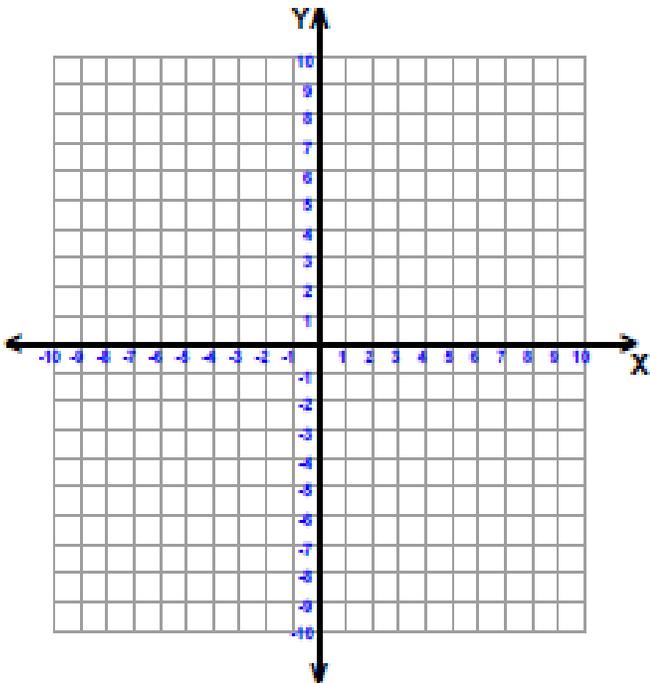
Find the Distance  
between the  
Points

(-2, 3) and (-8, 3)



(-4, -6) and (-1, -6)

(5, -10) and (5, -2)



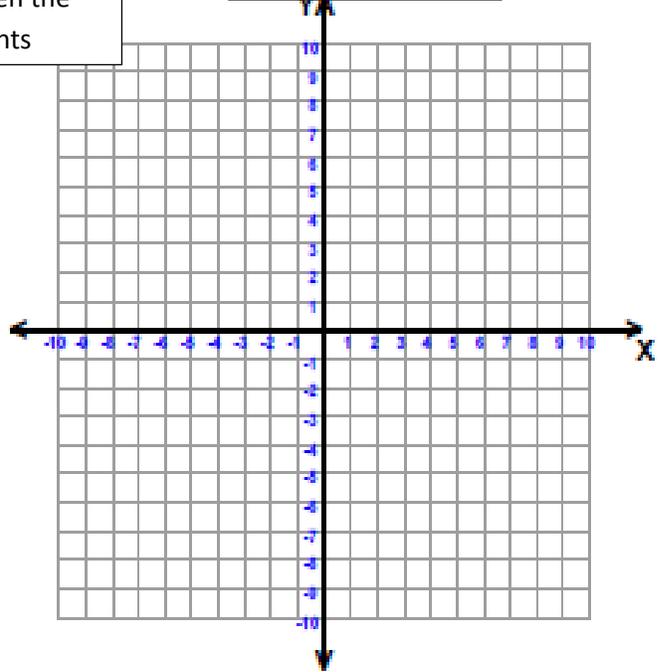
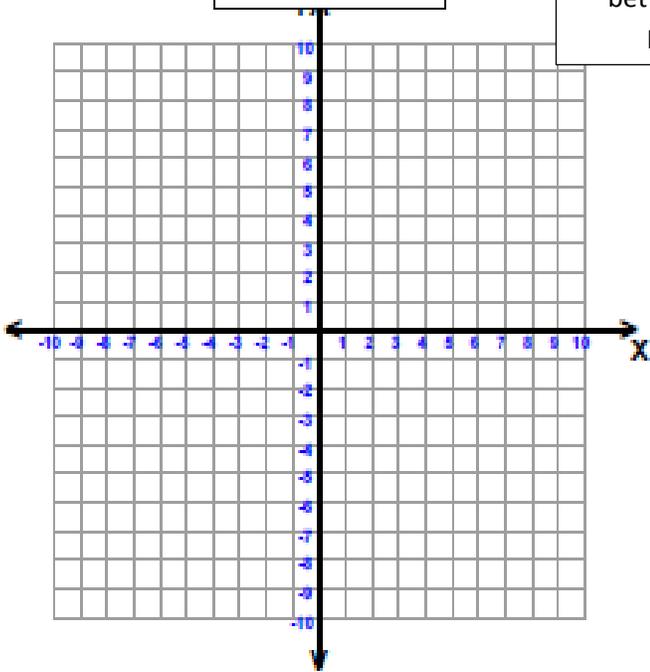
POINTS IN SAME QUADRANT:

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$(8, -6)$  and  $(8, 6)$

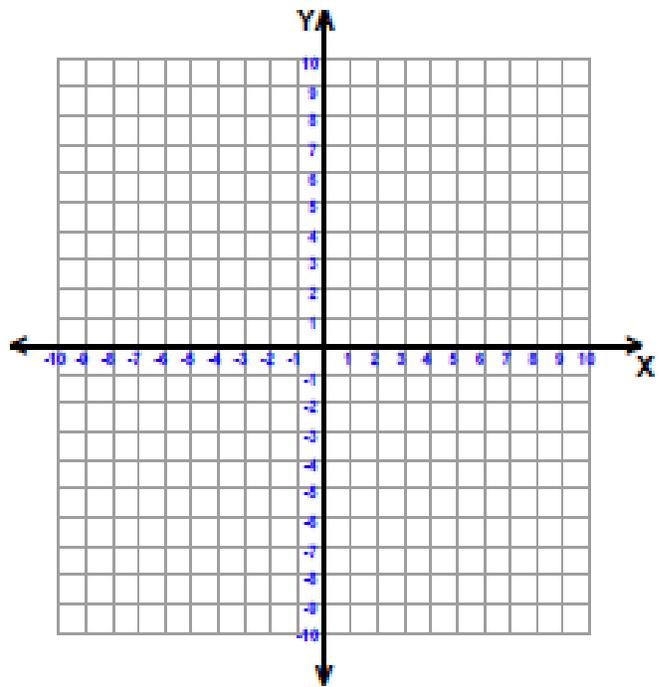
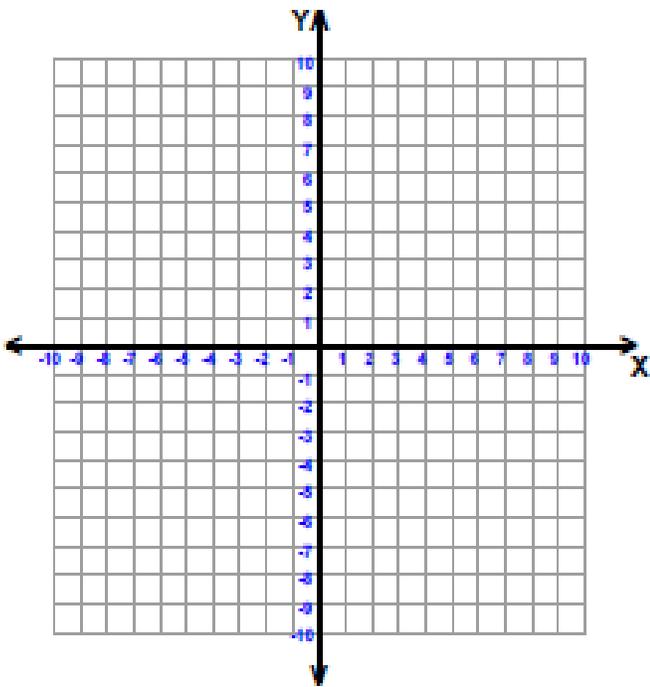
Find the Distance  
between the  
Points

$(-2, 10)$  and  $(5, 10)$



$(-3, 8)$  and  $(-3, -3)$

$(4, -5)$  and  $(-3, -5)$

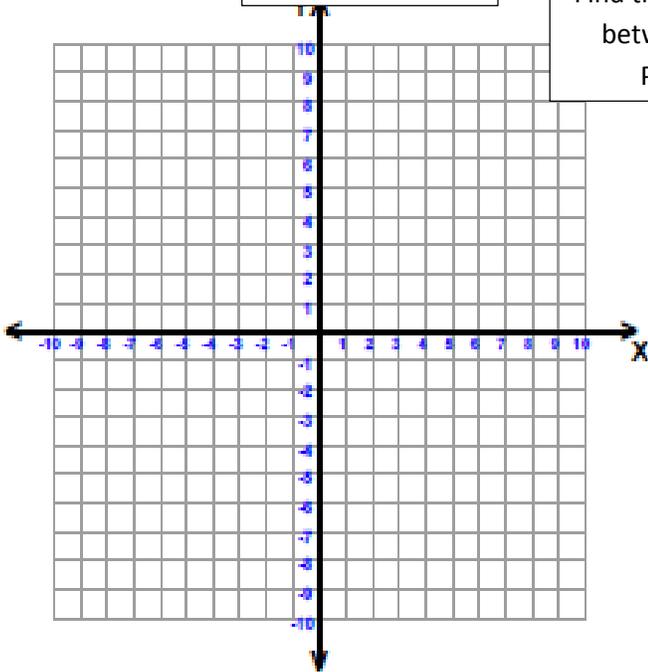


POINTS IN DIFFERENT QUADRANTS:

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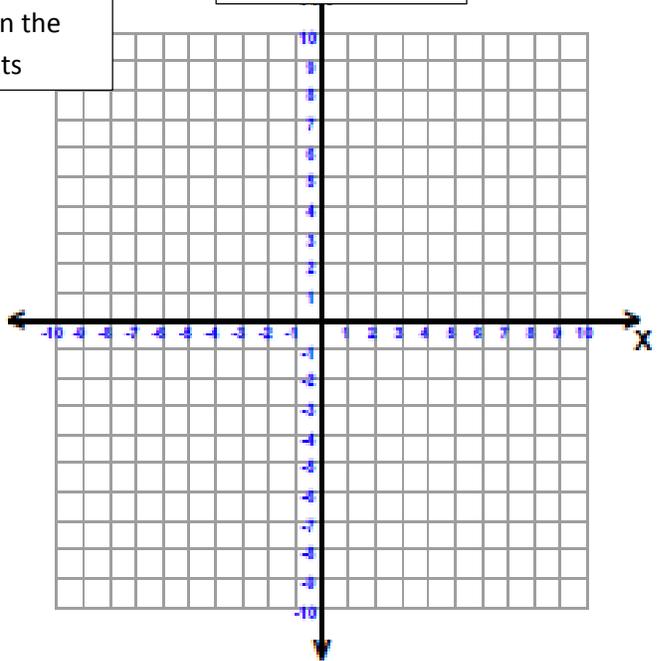
Think...same or different quadrants...so what should I do?

(5, -2) and (-6, -2)

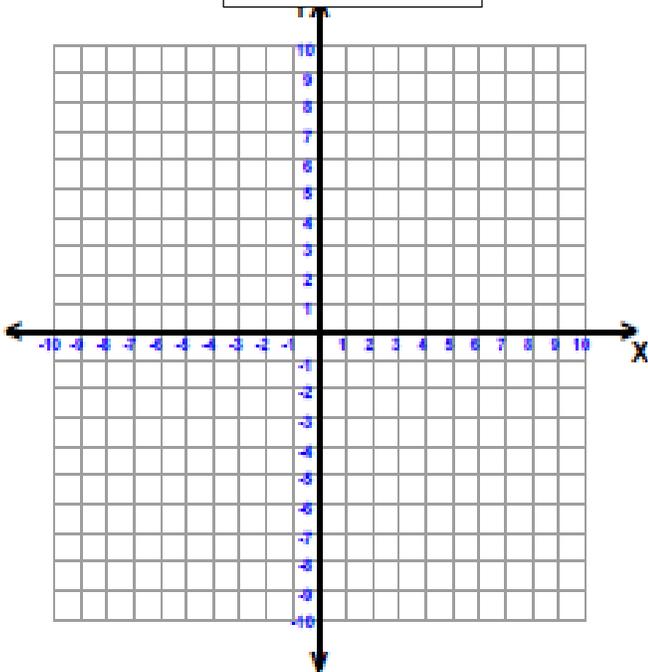


Find the Distance  
between the  
Points

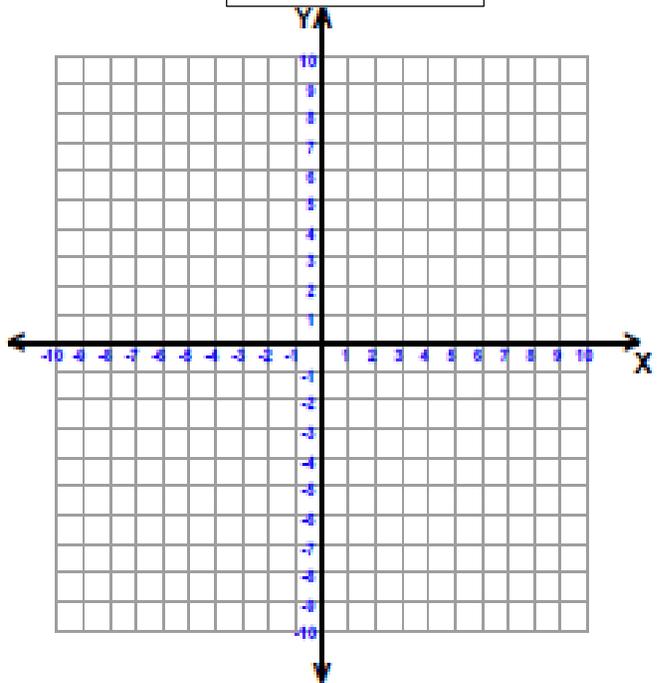
(-3, 4) and (-3, 8)



(9, -4) and (3, -4)



(2, -7) and (-2, -7)

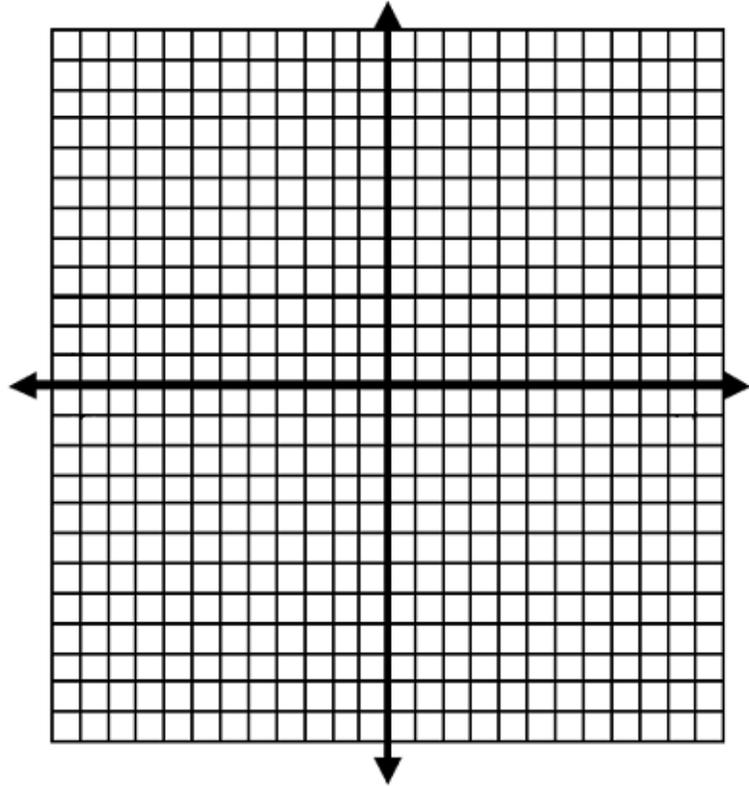


## Distance Between Points

Use the graph below to help solve the following problems.

Find the distance between the following points:

1.  $(4, 5)$  and  $(4, -8)$
2.  $(10, -7)$  and  $(10, 3)$
3.  $(-9, 6)$  and  $(4, 6)$
4.  $(-2, 5)$  and  $(-3, 5)$



Find the distance without using the graph.

1.  $(9, 5)$  and  $(9, -2)$
2.  $(-6, 3)$  and  $(-7, 3)$
3.  $(8, -4\frac{1}{4})$  and  $(8, 3\frac{1}{2})$
4.  $(8\frac{2}{3}, 4)$  and  $(-6\frac{1}{4}, 4)$

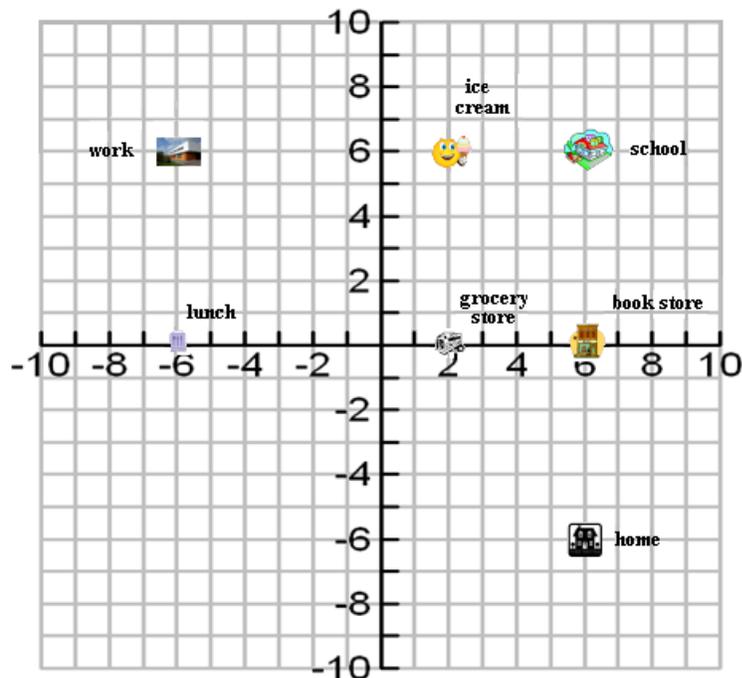
5. Tammy started at home at  $(4, 5)$  and then went to the store at  $(4, 2)$ . She decided to then stop for gas at  $(4, -3)$  and then to pick up her printed photos at  $(4, -5)$ . She then went home. What was Tammy's total distance?

## An Exhausting Day

Tammy had an exhausting day. She left the house early one morning and stopped several places throughout the day. Here is her journey.

- Started at home
- 1<sup>st</sup> stop was dropping her child at school
- 2<sup>nd</sup> stop work
- 3<sup>rd</sup> she went out to lunch
- 4<sup>th</sup> went back to work
- 5<sup>th</sup> picked up her child from school
- 6<sup>th</sup> took him out for ice cream for a special treat
- 7<sup>th</sup> stopped at the grocery store to get something for dinner
- 8<sup>th</sup> stopped at the book store
- 9<sup>th</sup> went home!
- **Note: the middle of the picture represents the ordered pair; for example the book store is located at (6,0)**

What was her total distance for the day? \_\_\_\_\_



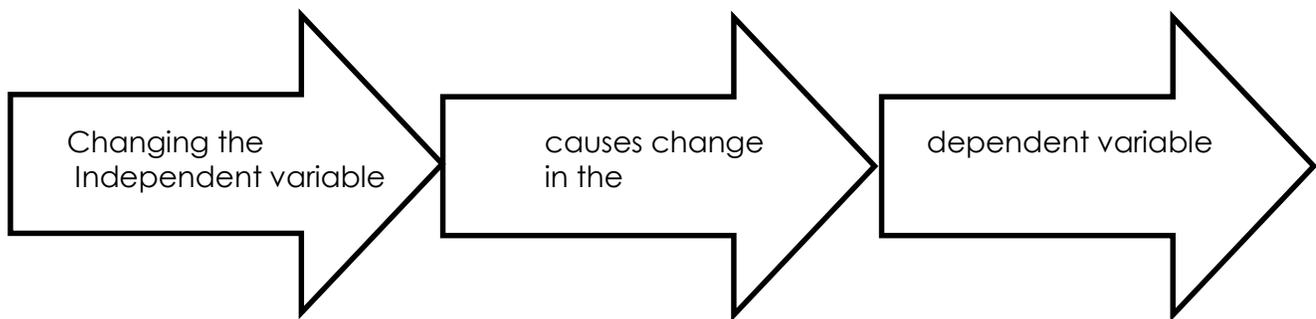
## Independent and Dependent Variables Notes

**Independent variable**~ is a variable in an equation that may have its value freely chosen without considering values of any other variable.

**Dependent variable**~ is a variable whose value depends on the values of one or more independent variables.

EX:  $y = 3x - 2$ ,

- the independent variable is  $x$
- the  $y$  is dependent since it depends on the number chosen for  $x$
- The final solution of the equation,  $y$ , depends on the value of  $x$ , the independent variable which can be changed.



The dependent variable depends on the independent variable

- $X$  is always the independent variable (Input)
- $Y$  is always the dependent variable. (Output)
  - What you get out depends on what you put in.

<b>Independent</b>	<b>Dependent</b>
--------------------	------------------

Decide which event is the independent and the dependent event.  
WRITE I or D in each box to label each as independent or dependent.

Remember that the dependent variable depends on the independent variable

Your height	The number of students attending the dance	The amount of groceries you purchase	The number of instruments the school purchases
Size of the cup	The number of school band members	The number of people in line ahead of you	The amount of salsa you can make
Math Test grade	The amount of money collected	The total number of voters	Whether you can ride rollercoasters
The number of strikes you pitch	The amount of blueberries you pick	The number of tickets needed for Walt Disney World	The number of blueberry muffins you can make
The number of green skittles	The number of students on the trip	The number of people attending the party	How much water it takes to fill it

The number of tomatoes you have	The number of buttons created	The number of cookie dough boxes sold	The size of the bag of skittles
The number of chicken wings to bring	The time it takes to wait in line	The length of the school dance	The amount of time you study
The number of songs the DJ plays	The number of plastic bags needed	The number of sodas to buy for the concession stand	Your chance at being the starting pitcher

Now create your own independent and dependent events.


The x-axis is always the INDEPENDENT VARIABLE—ex) Time.

The y-axis is always the DEPENDENT VARIABLE—ex) Price.





## Relationships Homework

Translate each statement into a mathematical equation. Complete each function table.

1.)  $y$  is equal to the product of 2 and  $x$  minus 4

Mathematical Translation: \_\_\_\_\_

$x$	$y$
4	
6	
10	
20	

2.)  $y$  is equal to three more than the product of 4 and  $x$ .

Mathematical Translation: \_\_\_\_\_

$x$	$y$
10	
20	
30	
40	

3.)  $y$  is equal to the product of six and  $x$ .

Mathematical Translation: \_\_\_\_\_

$x$	$y$
3	
6	
9	
10	

4.)  $y$  is equal to two less than  $x$ .

Mathematical Translation: \_\_\_\_\_

$x$	$y$
2	
5	
10	
20	

5.)  $y$  is equal to the quotient of  $x$  and 2. (Decimal or fraction answers are acceptable)

Mathematical Translation: \_\_\_\_\_

$x$	$y$
4	
5	
6	
7	

6.) Multiple Choice: Determine the equation that matches this function table

a.)  $y = 4x$

b.)  $y = 3x$

c.)  $y = x + 6$

$x$	$y$
2	8
5	11
6	12
10	16

**Problem A**

Translate the statement into a mathematical equation, and then complete the function table:

$y$  is equal to two more than the product of  $x$  and 3.

Mathematical translation: \_\_\_\_\_

Complete the table of values:

$x$	$y$
0	
1	
2	
3	

**Problem B**

Translate the statement into a mathematical equation, and then complete the function table:

$y$  is equal to three less than the product of 2 and  $x$ .

Mathematical translation: \_\_\_\_\_

Complete the table of values:

$x$	$y$
3	
4	
5	
6	

**Problem C**

Translate the statement into a mathematical equation, and then complete the function table:

$y$  is equal to the quotient of  $x$  and 2.

Mathematical translation: \_\_\_\_\_

Complete the table of values:

$x$	$y$
0	
2	
4	
6	

**Problem D**

Translate the statement into a mathematical equation, and then complete the function table:

$y$  is equal to two less than the sum of 2 and  $x$ .

Mathematical translation: \_\_\_\_\_

Complete the table of values:

$x$	$y$
0	
1	
2	
3	

**Problem E:**

$y$  is equal to one more than the product of 2 and  $x$ .

Mathematical translation:

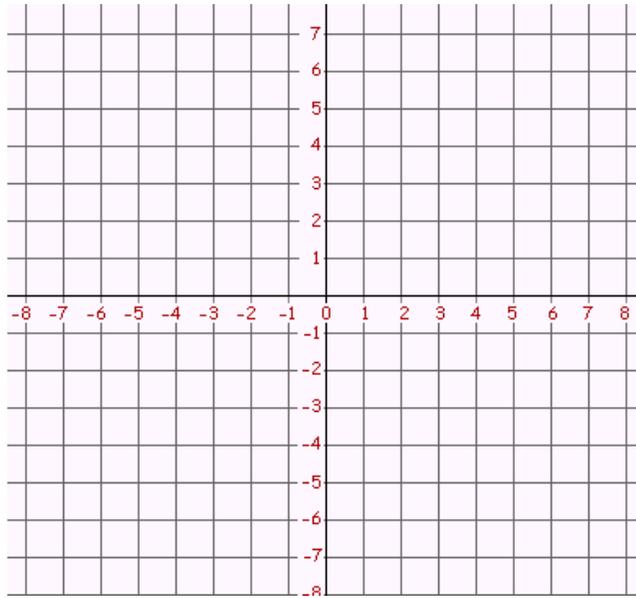
Complete the table of values:

$x$	$y$
0	
1	
2	
3	

Graphing Equations Homework

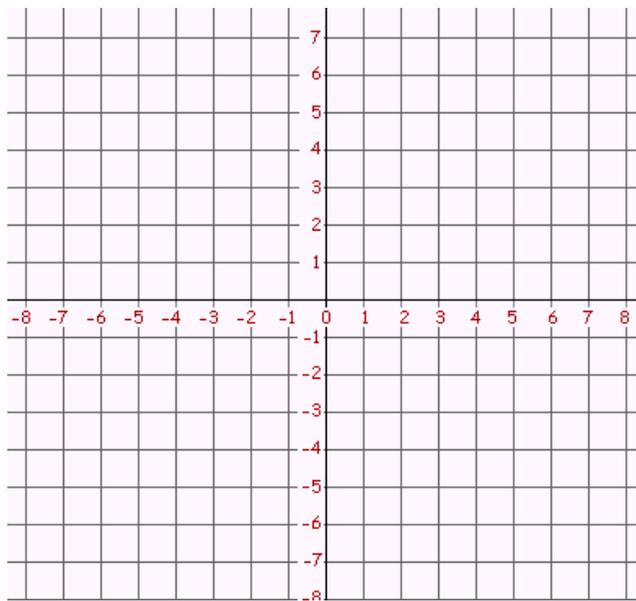
1.  $y = 2x - 1$

x	y
2	
3	
4	

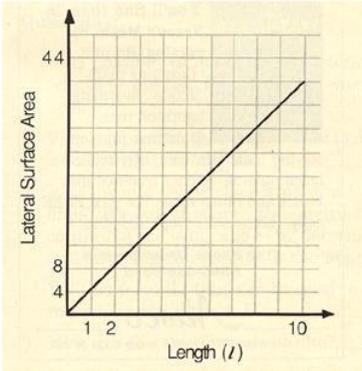


2.)  $y = \frac{x}{3} + 1$

x	y
0	
3	
6	



## Constant of Proportionality Notes

What is a constant of proportionality?	<p>The constant value of the ratio of two proportional quantities.</p> <p>Also is classified as the unit rate.</p>												
How to identify the constant of proportionality?	<p>You can identify the constant of proportionality in tables, graphs, equations and other proportional relationships.</p> <p>*Recall how to compute the unit rate. Use those same strategies to find the constant of proportionality.</p>												
Example 1: Tables	<p>Analyze the table.</p> <table border="1"> <tr> <td>number of pens (p)</td> <td>3</td> <td>5</td> <td>8</td> <td>10</td> <td>15</td> </tr> <tr> <td>Cost (C)</td> <td>\$6</td> <td>\$10</td> <td>\$16</td> <td>\$20</td> <td>\$30</td> </tr> </table> <p>What is the cost of 1 pen?</p> <p>*The cost of 1 pen is \$2. 2 is the constant of proportionality because it is the constant value of the ratio between the number of pens and the cost.</p> <p>*The equation can be written as <math>C = 2p</math>, which represents the total cost (C) equals 2 dollars times the number of pens (p) purchased.</p>	number of pens (p)	3	5	8	10	15	Cost (C)	\$6	\$10	\$16	\$20	\$30
number of pens (p)	3	5	8	10	15								
Cost (C)	\$6	\$10	\$16	\$20	\$30								
Example 2: Graphs	<p>Using the graph, determine the constant of proportionality.</p> <div style="text-align: center;">  </div> <p>To determine the constant of proportionality, find the unit rate. To find the unit rate, look where the Length is 1 unit. What is the Lateral Surface Area when the Length is 1?</p> <p>*4 is the constant of proportionality. If you follow the ratio, the constant is 4 because 1:4, 2:8, 3:12, and etc.</p> <p>*The equation for this would be <math>A = 4L</math> meaning the area (A) equations 4 times the length (L).</p>												

Example 3: Equations	<p>Since we know that proportional equations contain only multiplication or division, use the coefficient to identify the constant of proportionality.</p> <ol style="list-style-type: none"> <li>The amount of sales tax paid on an item is proportional to the cost of the item. If the sales tax rate is 7%, then the amount of the sales tax (<math>t</math>) is .07 times the cost (<math>c</math>) of the item. The equation is <math>t = .07c</math> can be used to determine the amount of sales tax. What is the constant of proportionality?</li> </ol> <p>*The constant is .07 or 7% since that is the coefficient of the equation.</p>
Example 4: Verbal Descriptions	<p>In probability, the chance to roll a 1 when rolling a number cube is <math>\frac{1}{6}</math>. In the long run, the number of times you get a 1 is proportional to the number of times you roll. If you roll 30 times, you would expect to roll a 1 five times. The constant is <math>\frac{1}{6}</math> because it is the constant value of the ratio when comparing the number how many 1s are on a number cube (1:6).</p>

## Constant of Proportionality Practice

<p>1. The perimeter of a square increases as the lengths of the sides increase. The equation <math>P = 4s</math> can be used to determine the perimeter of any square. What is the constant of proportionality for this proportional relationship?</p>	<p>2. The circumference of a circle is proportional to the length of the diameter. Use the formula <math>C = \pi d</math>, to identify the constant of proportionality.</p>								
<p>3. Candy bars cost \$1.25 each. The expression <math>1.25c</math> represents the total cost of <math>c</math> candy bars. What is the constant?</p>	<p>4. The grocery store charges \$1.00 for 4 plums. What is the price per plum?</p>								
<p>5. A dragonfly travels 50m in 2 seconds. What is the speed that a dragonfly travels?</p>	<p>6. Using the table, generate an equation and find the constant of proportionality.</p> <table border="1" style="margin: 20px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Distance</th> <th style="padding: 5px;">Time</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">2 miles</td> <td style="padding: 5px;">10 mins</td> </tr> <tr> <td style="padding: 5px;">5 miles</td> <td style="padding: 5px;">25 mins</td> </tr> <tr> <td style="padding: 5px;">8 miles</td> <td style="padding: 5px;">40 mins</td> </tr> </tbody> </table>	Distance	Time	2 miles	10 mins	5 miles	25 mins	8 miles	40 mins
Distance	Time								
2 miles	10 mins								
5 miles	25 mins								
8 miles	40 mins								
<p>7. Sales tax in North Carolina is 6.75%. The higher the total, the more the tax will be. Does sales tax and total cost represent a proportional relationship?</p>	<p>8. To babysit, you charge \$15 for the first hour and then \$7 for each hour after that. You worked a total of 4 hours today and charged \$36. Does the babysitting fee &amp; hours represent a proportional relationship?</p>								

1. Find the constant of proportionality from the table below. Show your work!

<b>X</b>	7.5	10	17.5	20
<b>Y</b>	4.5	6	10.5	12

2. Find the constant of proportionality from the table below. Show your work!

<b>X</b>	1.5	2	3.5	5
<b>Y</b>	10.5	14	24.5	35

3. Find the constant of proportionality from the table below. Show your work!

<b>X</b>	2	4	5	7
<b>Y</b>	1	2	2.5	3.5

4. Find the constant of proportionality from the table below. Show your work!

<b>X</b>	2	3	5	6
<b>Y</b>	6	9	15	18

5. Find the constant of proportionality from the table below. Show your work!

<b>X</b>	2	4	7	9
<b>Y</b>	0.4	0.8	1.4	1.8

6. Find the constant of proportionality from the table below. Show your work!

<b>X</b>	1.5	3	4.5	12
<b>Y</b>	1	2	3	8

7. Find the constant of proportionality from the equations below:

a)  $y = 7.25x$

b)  $y = 4x$

c)  $y = \frac{7}{8}x$

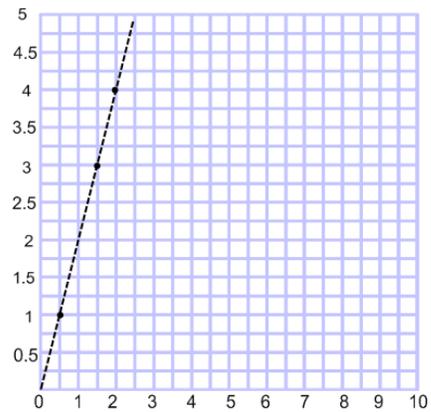
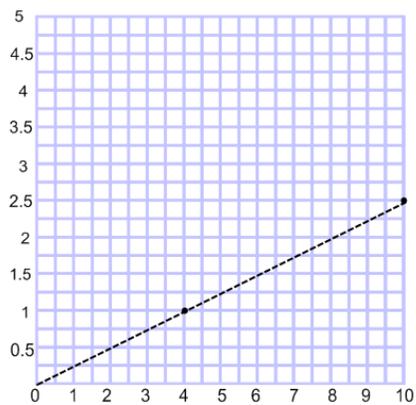
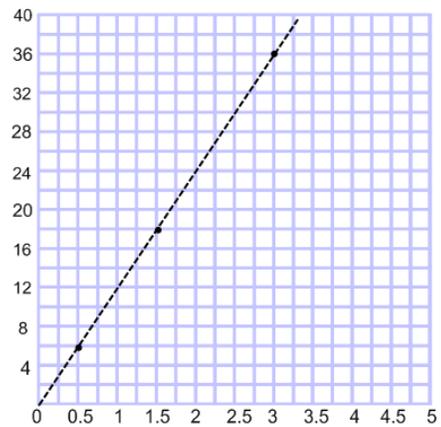
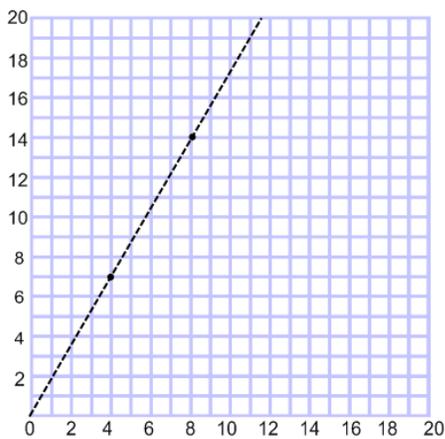
8. Find the constant of proportionality from the equations below:

a)  $y = 3.8x$

b)  $y = 7x$

c)  $y = \frac{2}{3}x$

9. Find the constant of proportionality from the graphs below:



**Are they proportional?**

Look at each graph and select 2 ordered pairs (not including the origin) and make a table that corresponds to the graph. Decide if the graph is proportional or not. (Graphs are on next 3 pages)

Graph #1

Money spent on stamps	Total number of stamps

Proportional? \_\_\_\_\_

Graph #4

Sticks of butter	Number of cakes

Proportional? \_\_\_\_\_

Graph #7

Attendees	Cost

Proportional? \_\_\_\_\_

Graph #10

Cups of sugar	Number of pies

Proportional? \_\_\_\_\_

Graph #2

Months	Total books read

Proportional? \_\_\_\_\_

Graph #5

Cups sold	Earnings

Proportional? \_\_\_\_\_

Graph #8

Weight	Cost

Proportional? \_\_\_\_\_

Graph #11

Taxable amount	Amount of tax

Proportional? \_\_\_\_\_

Graph #3

Number of seed packets	Number of flowers

Proportional? \_\_\_\_\_

Graph #6

Time	Height

Proportional? \_\_\_\_\_

Graph #9

Practices	Distance

Proportional? \_\_\_\_\_

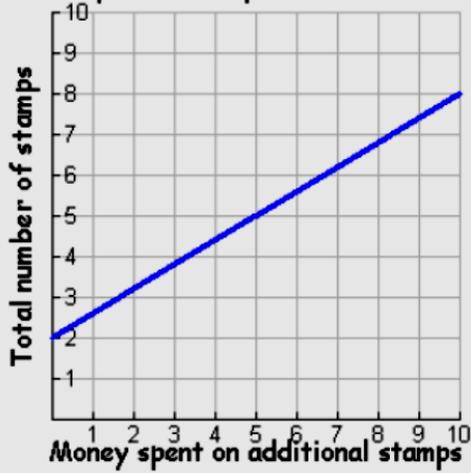
Graph #12

Time in class	Number of pages

Proportional? \_\_\_\_\_

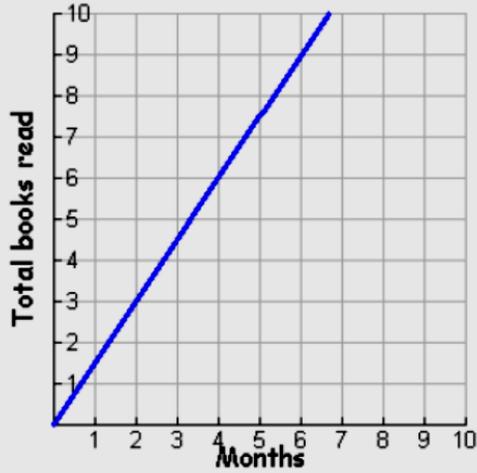
Graph #1

Stamps in Josephine's collection



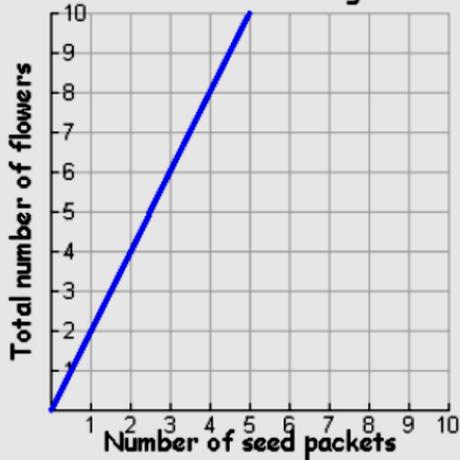
Graph #2

Books Shakina has read



Graph #3

Flowers in Carson's garden

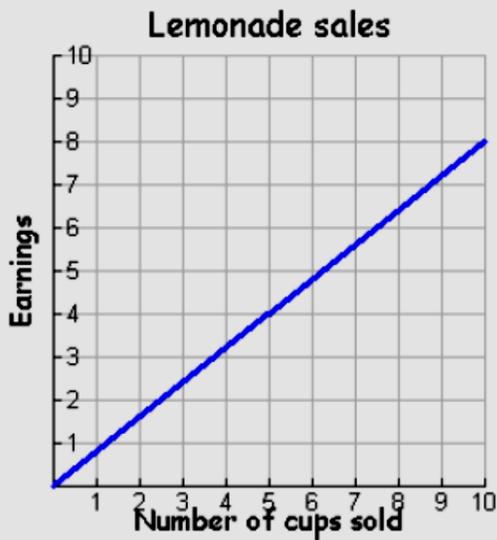


Graph #4

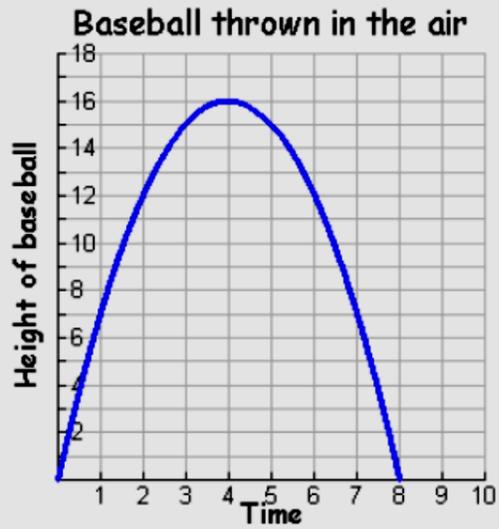
Cakes baked



Graph #5



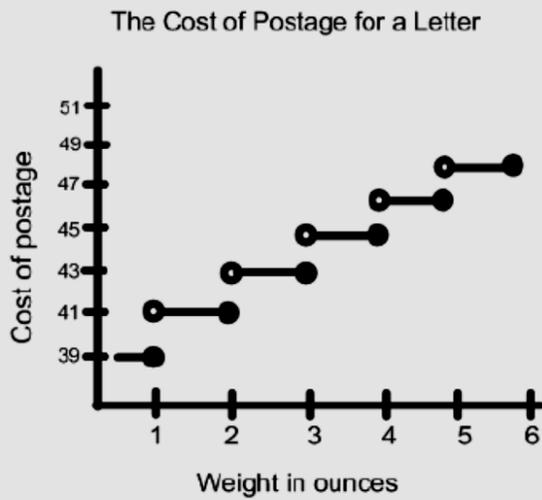
Graph #6



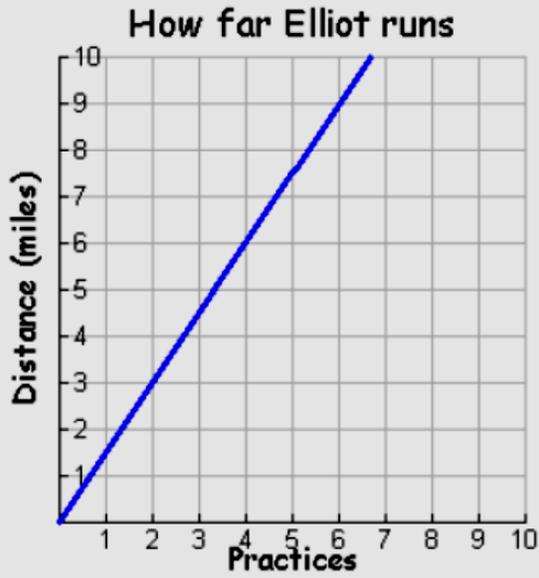
Graph #7



Graph #8



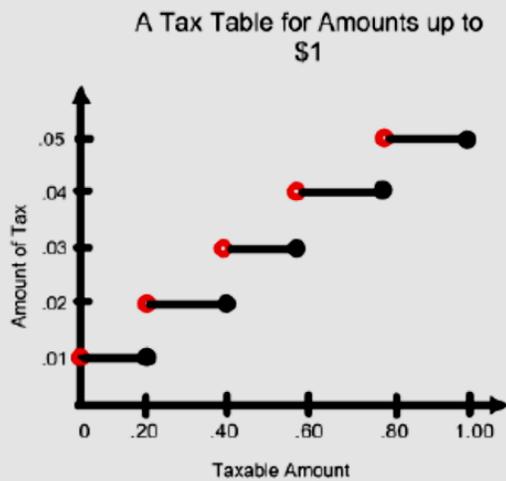
Graph #9



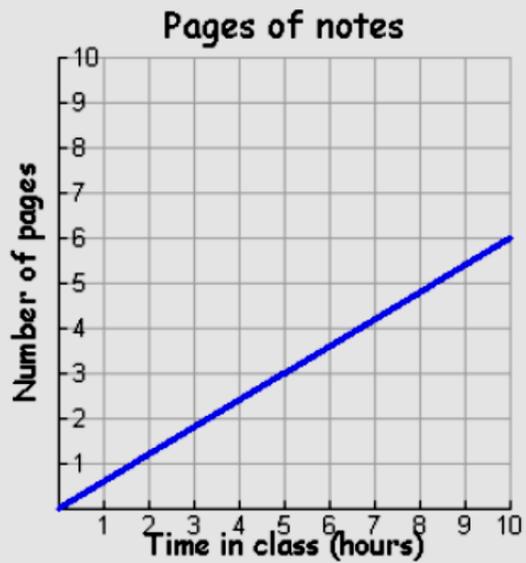
Graph #10



Graph #11



Graph #12



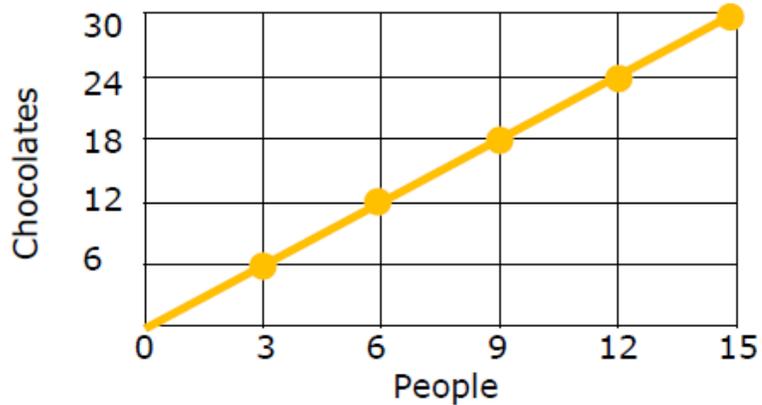


The graph above represents one of the contestants' data at a hot dog eating contest. Answer the following questions based on your knowledge of ratios and proportional relationships.

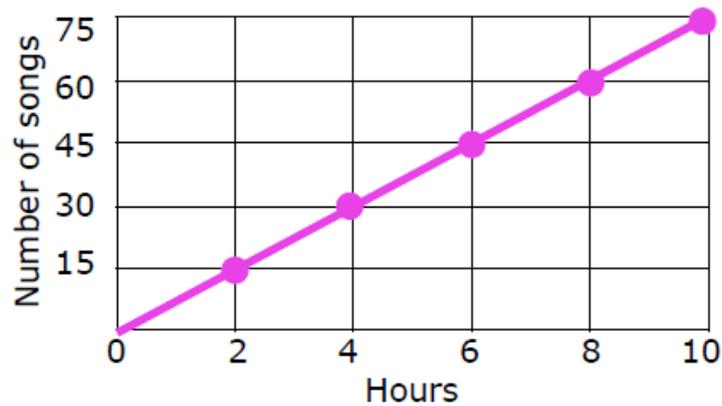
1. Does the graph represent a proportional relationship? How do you know?
2. What is the constant of proportionality?
3. What ordered pair on the graph makes the constant of proportionality easy to determine?
4. What does the ordered pair (0,0) represent in this graph?
5. What is an equation that would represent the relationship shown in the graph?

Random Constant of Proportionality Problems:

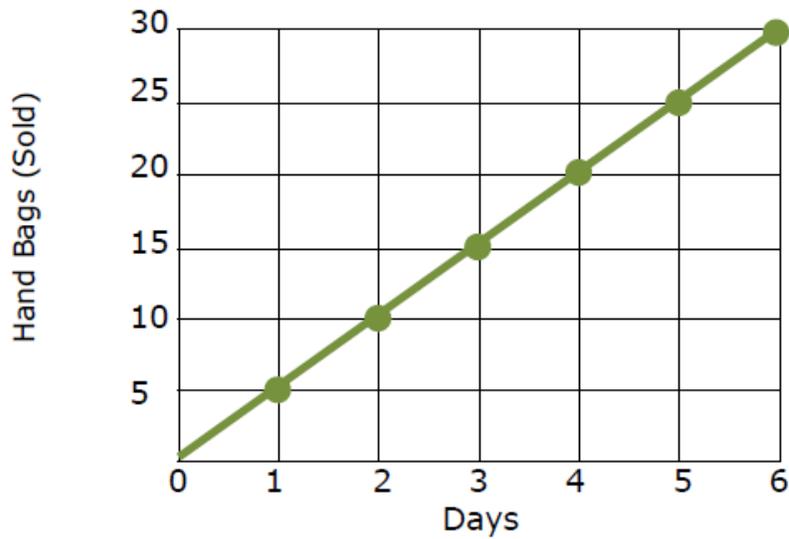
4. The graph below represents the chocolate consumed by people. What is the constant of proportionality?



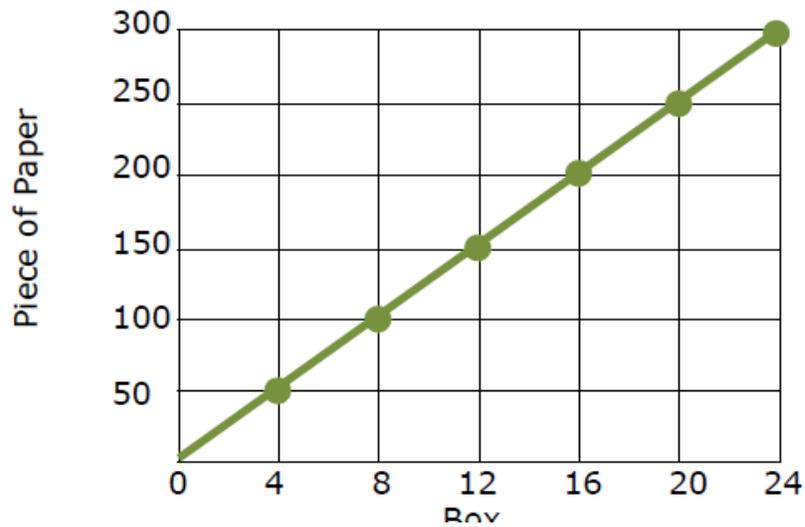
5. The graph below represents the number of songs played on a radio station. What is the constant of proportionality?



6. The graph below represents the number of hand bags sold over a certain number of days. What is the constant of proportionality?



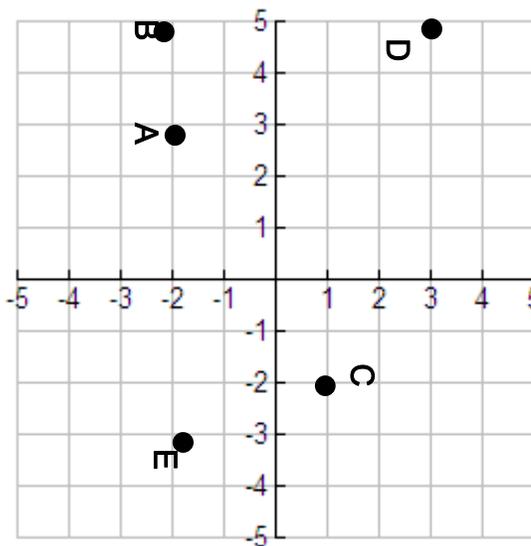
7. The graph below represents the number of pieces of paper that are found in boxes. What is the constant of proportionality?



### Unit 9 Study Guide

**For part I, name each graphed point and tell what quadrant the point is in.**

1. A ( , ) is in Quadrant \_\_\_\_\_
2. B ( , ) is in Quadrant \_\_\_\_\_
3. C ( , ) is in Quadrant \_\_\_\_\_
4. D ( , ) is in Quadrant \_\_\_\_\_
5. E ( , ) is in Quadrant \_\_\_\_\_



**For part II, answer each question about coordinate graphing.**

6. What is the origin?
  7. On the graph above right, label the x-axis and the y-axis.
  8. For point C above, reflect it across the x-axis. Where is it now? ( , )
  9. For point E above, reflect it across the y-axis. Where is it now? ( , )
  10. Find the distance between points A and B. \_\_\_\_\_
  11. Find the distance between points B and D. \_\_\_\_\_
  12. How can you remember the order of the quadrants? \_\_\_\_\_
  13. If two points are in a line and are in the same quadrant, just \_\_\_\_\_ the absolute values of the coordinates that are not alike.
  14. If two points are in a line and are in different quadrants, just \_\_\_\_\_ the absolute values of the coordinates that are not alike.
  15. A snail crawls 3 inches per minute. Number of minutes is the \_\_\_\_\_ variable and the number of inches crawled is the \_\_\_\_\_ variable.
  16. Joey makes a graph about the # of ice cubes that melt over time.  
 \_\_\_\_\_ depends on \_\_\_\_\_.
- What is the independent variable? \_\_\_\_\_ Dependent? \_\_\_\_\_

17. Translate the statement into a mathematical equation, and then complete the function table:

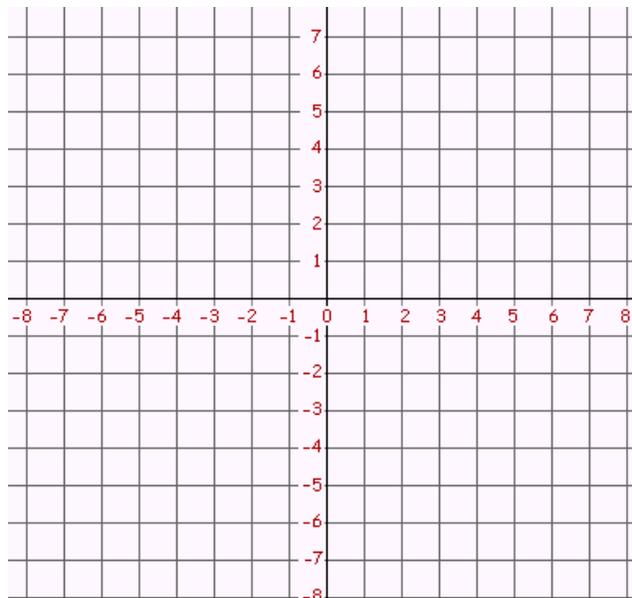
$y$  is equal to three less than the product of  $x$  and 4.

Mathematical translation: \_\_\_\_\_

Complete the table of values:

$x$	$y$
1	
2	
3	
4	

Graph the relationship onto the coordinate plane:

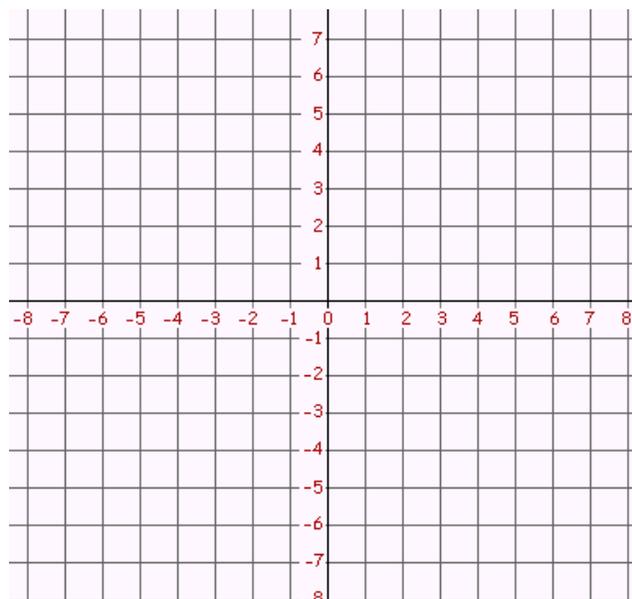


18.  $y = \frac{1}{2}x + 7$

Complete the table of values:

Graph the relationship onto the coordinate plane:

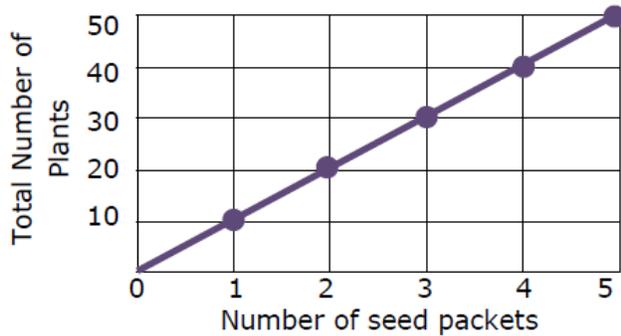
$x$	$y$
2	
4	
6	
4	



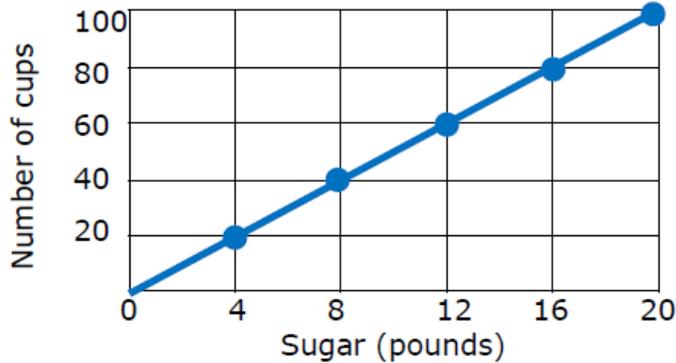
19. How do you determine if a table shows a proportional relationship?

20. How do you determine if a graph shows a proportional relationship?

21. The graph below represents the total number of plants and the number of seed packets used. What is the constant of proportionality?



22. The graph below represents the total number of cups of coffee and the total amount of sugar required to make the coffee. What is the constant of proportionality?



23. The graph below represents the packets of biscuits consumed over time. What is the constant of proportionality? What is the independent variable? What is the dependent variable?

