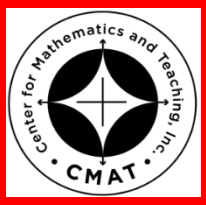
Name _____ Period _____ Date _____



MathLinks

8-8
STUDENT PACKET

MATHLINKS GRADE 8
STUDENT PACKET 8
SLOPE AND SLOPE-INTERCEPT FORM OF A LINE

WORD BANK

Word or Phrase	Definition or Explanation	Example or Picture
congruent		
input-output rule		
linear function		
slope-intercept form of a linear equation		
slope of a line		
x-intercept		
y-intercept		

INTRODUCTION TO SLOPE

Summary (Ready)

We will count distances and use slope definitions to find slopes of line segments on a grid and on a set of coordinate axes. We will explore the meaning of positive and negative slopes.

Goals (Set)

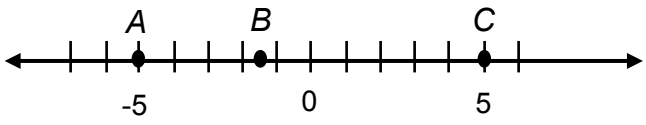
- Explore the meaning of slope of a line.
- Find the slope of a line using counting methods and the slope formula.
- Recognize that segments with the same slope lie on the same line or on parallel lines.

Warmup (Go)

1. Write four equivalent fractions for $\frac{3}{4}$. Include some negative numbers in the numerator and denominator. _____ _____ _____ _____

2. Write four equivalent fractions for $-\frac{5}{3}$. Include some negative numbers in the numerator or denominator. _____ _____ _____ _____

3. Find each distance on the number line.



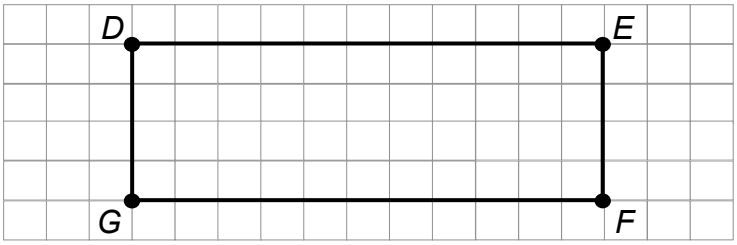
From *A* to *C* :_____ From *B* to *C* :_____ From *C* to *A*:_____

4. Find each distance on the grid (each small square is one square unit):

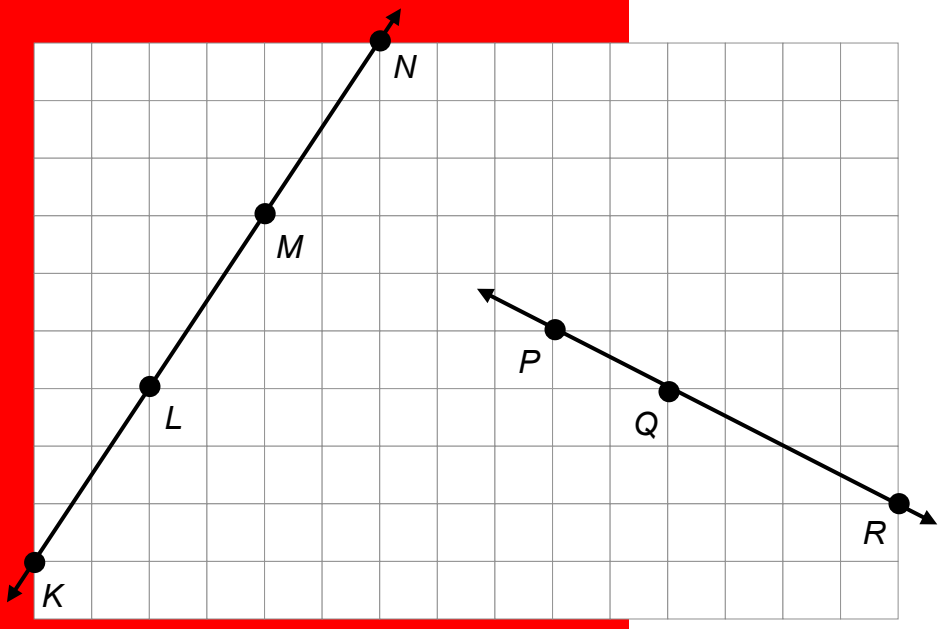
a. From *G* to *D*: _____

b. From *G* to *F*: _____

c. From *E* to *F*: _____



SLOPE NOTES 1



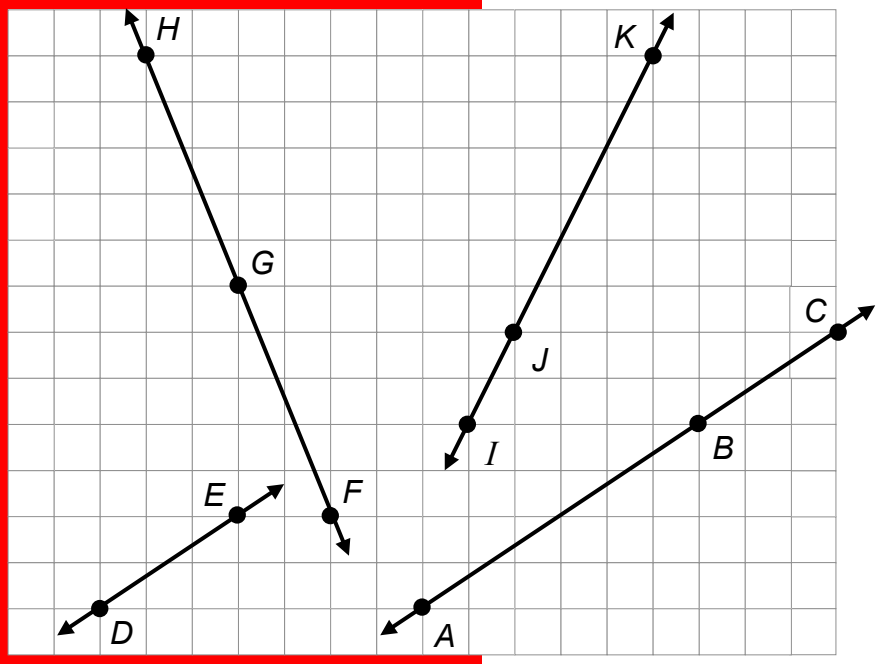
Definition of slope:

Without counting, determine whether each slope is positive or negative. Then find the slope of each line segment by counting the vertical and horizontal change as demonstrated by your teacher.

1. Slope of $\overline{KL}$: _____	5. Slope of $\overline{PQ}$: _____
2. Slope of $\overline{NL}$: _____	6. Slope of $\overline{QR}$: _____
3. Slope of $\overline{KN}$: _____	7. Slope of $\overline{RP}$: _____
4. Simplify each fraction. What do you notice?	8. Simplify each fraction. What do you notice?

9. Make a conjecture about slopes of line segments that lie on the same line.

SLOPE PRACTICE 1



Without counting, determine whether each slope is positive or negative. Then find the slope of each line segment by forming a ratio of the vertical change to the horizontal change.

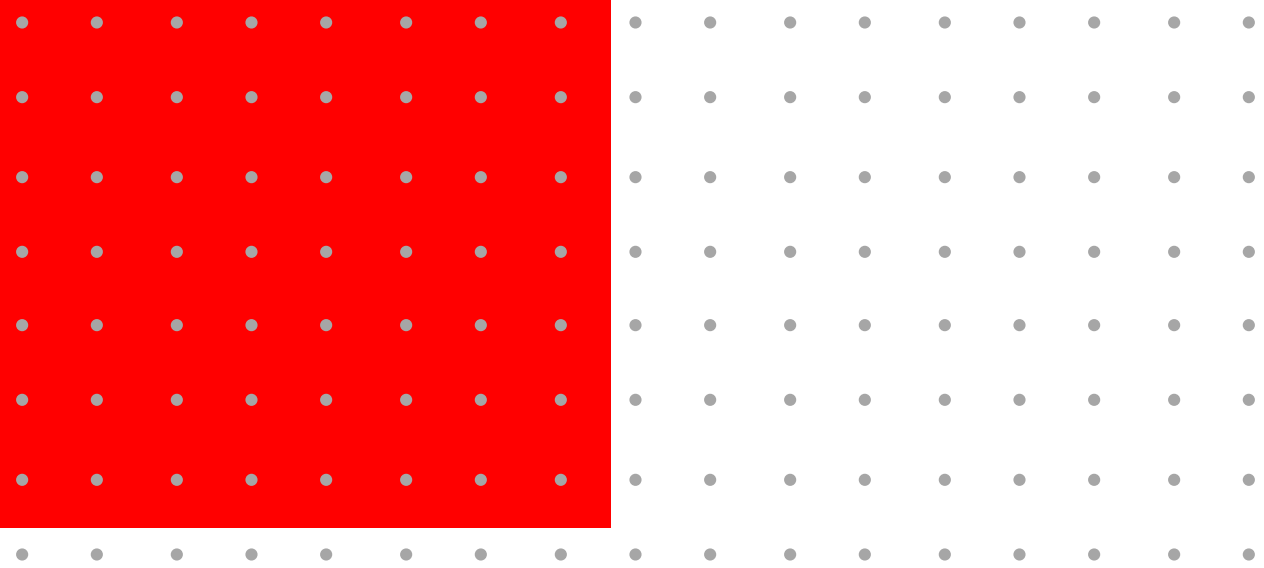
1. Slope of $\overline{AB}$: _____
2. Slope of $\overline{AC}$: _____
3. Slope of $\overline{CB}$: _____
4. Slope of $\overline{DE}$: _____
5. Slope of $\overline{FG}$: _____
6. Slope of $\overline{FH}$: _____
7. Slope of $\overline{IJ}$: _____
8. Slope of $\overline{KI}$: _____

9. What do you notice about the slopes of line segments lying on the same line?

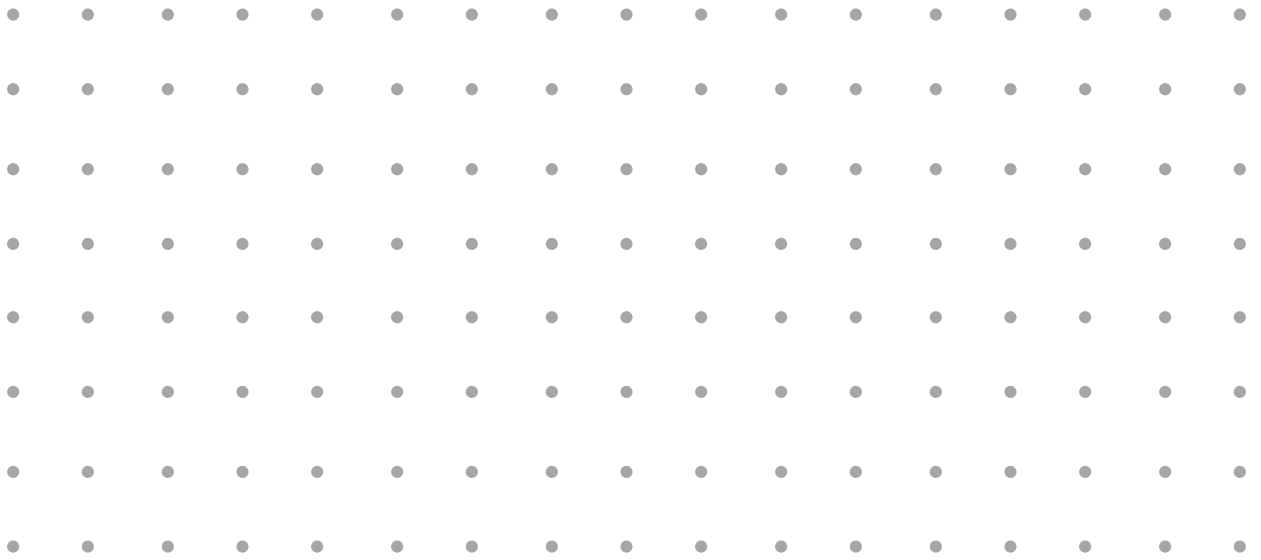
10. Which lines appear parallel? What do you notice about the slopes of parallel lines?

DRAWING LINE SEGMENTS

1. Locate a point on this grid. From that point, count vertical and horizontal distances to create a line segment with a slope of $\frac{3}{4}$. Repeat and create line segments with other slopes: $\frac{6}{8}$, $\frac{-3}{-4}$. What do you notice?



2. Locate a point on this grid. From that point, count vertical and horizontal distances to create a line segment with a slope of 2. Repeat and create line segments with other slopes: $\frac{-4}{-2}$, $\frac{6}{3}$. What do you notice?



COMPUTATION PRACTICE

Evaluate each expression.

	Column I	Column II	Column III
1.	(6) – (4)	(4) – (6)	-[(4) – (6)]
2.	(-2) – (5)	(5) – (-2)	-[(5) – (-2)]
3.	(-4) – (-1)	(-1) – (-4)	-[(-1) – (-4)]

4. Which column has the same results as Column I? _____

5. Describe in words how the numbers in this column relate to those in Column I.

6. Generalize this relationship with symbols:

$a - b =$ _____

Evaluate each expression.

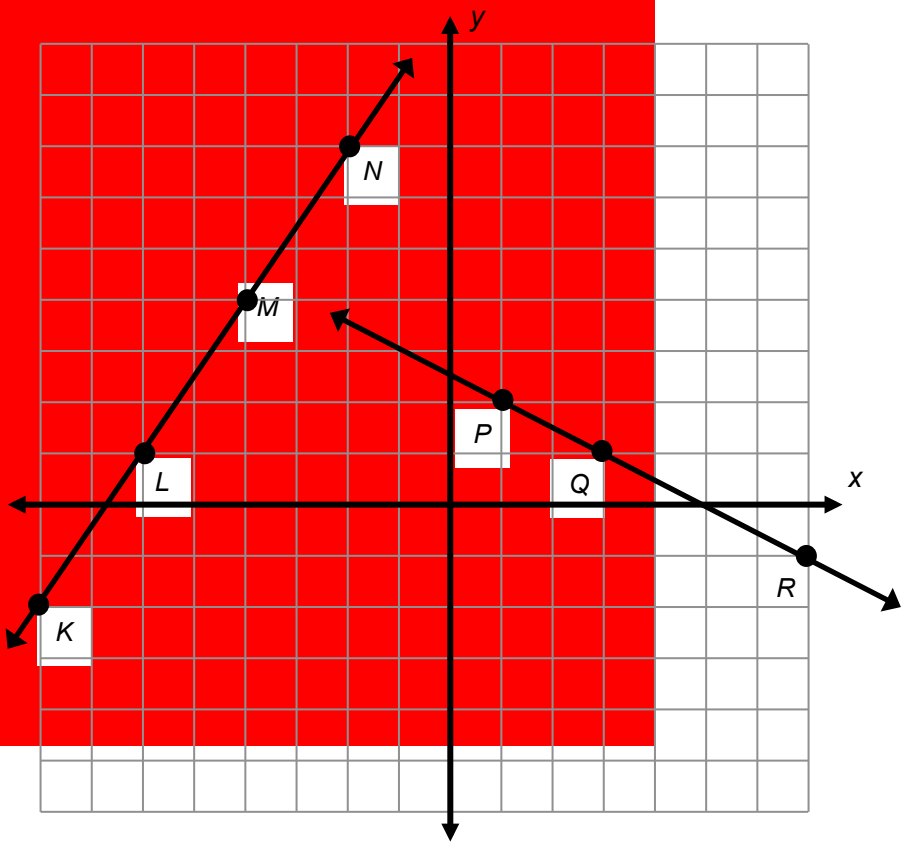
	Column IV	Column V
7.	$\frac{(2)-(5)}{(6)-(4)}$	$\frac{(5)-(2)}{(4)-(6)}$
8.	$\frac{(-1)-(-2)}{(-4)-(-3)}$	$\frac{(-2)-(-1)}{(-3)-(-4)}$
9.	$\frac{(3)-(-8)}{(12)-(11)}$	$\frac{(-8)-(3)}{(11)-(12)}$

10. Are the results in these two columns the same or different? _____

11. Generalize this pattern with symbols:

$$\frac{a-b}{c-d} = \text{\_\_\_\_\_}$$

SLOPE NOTES 2

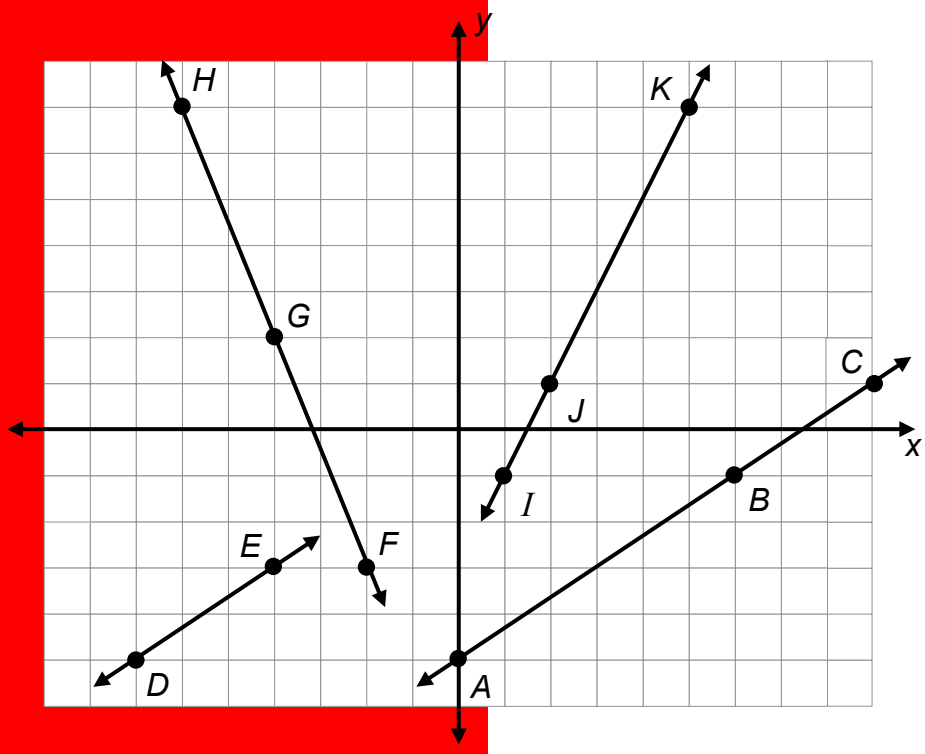


Definition of slope:

Without counting or computing, determine whether each slope is positive or negative. Then identify each point as an ordered pair and find the slope of each line segment as demonstrated by your teacher.

1. $\overline{KN}$ has a _____ slope.
2. K: (_____ , _____)
3. N: (_____ , _____)
4. Slope of $\overline{KN}$: _____
5. $\overline{PQ}$ has a _____ slope.
6. P: (_____ , _____)
7. Q: (_____ , _____)
8. Slope of $\overline{PQ}$: _____

SLOPE PRACTICE 2



Without counting or computing, first determine whether each line segment has a positive or negative slope and circle the appropriate sign below. Then use the slope formula to calculate the slope of each line segment.

1. Slope of $\overline{FG}$: + or −	5. Slope of $\overline{ED}$: + or −
2. Slope of $\overline{FH}$: + or −	6. Slope of $\overline{DE}$: + or −
3. Slope of $\overline{IJ}$: + or −	7. Slope of $\overline{CB}$: + or −
4. Slope of $\overline{KI}$: + or −	8. Slope of $\overline{AC}$: + or −

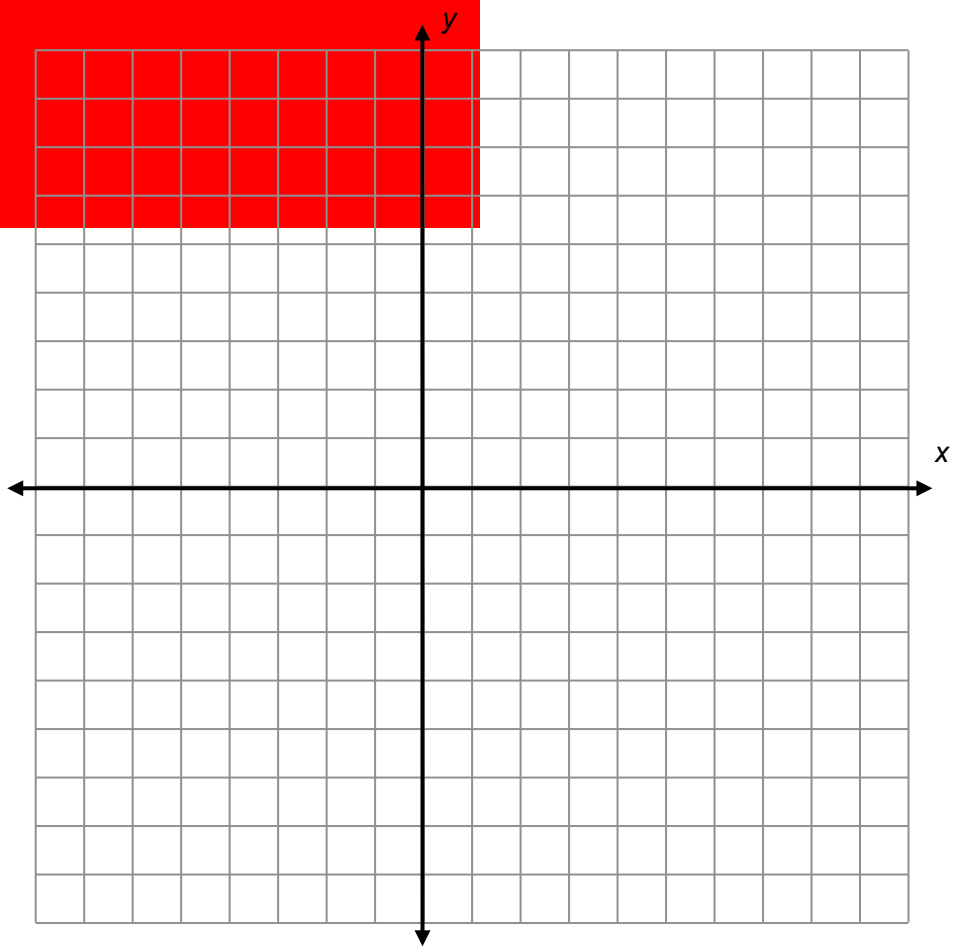
CREATING LINES

1. Draw a line through a point *A*(2, 7) with a slope of $\frac{1}{3}$.

2. Draw a line through a point *B*(-2, 0) with a slope of $\frac{3}{4}$.

3. Draw a line through a point *C*(0, -6) with a slope of $-\frac{1}{2}$.

4. Draw a line through a point *D*(5, 5) with a slope of -4.



INPUT-OUTPUT INVESTIGATION

Summary (Ready)

We will use input-output tables to help us graph and find equations of lines.

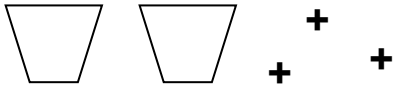
Goals (Set)

- Evaluate expressions.
- Graph linear functions.
- Interpret the slope and *y*-intercept of a line.
- Find equations of lines in slope-intercept form.

Warmup (Go)

Recall the cups and counters model from previous lessons.

- The counters pictured each have a value of 1.
- The cups pictured can hold any value.
- Since a cup has an unknown value, we will call it *x*.



1. A variable expression for this collection of cups and counters is _____.

Use any method to find the value of the collection for each given value of the cup (*x*).

2. If $x = 4$	3. If $x = -0.5$	4. If $x = 8\frac{3}{4}$

INTRODUCTION TO THE INPUT-OUTPUT GAME

Stacey and Megan are playing a game. Stacey has a bag with some cups (each represents the unknown) and positive counters (each represents one unit) in it.

Megan asks Stacey, "If the value of a cup is 3, what is the value of your bag?"

Stacey replies, "If the value of a cup is 3, then the value of my bag is 13."

Let V represent a cup
Let + represent a counter.

1. Megan writes on her paper:

   V + + + + + + + + + +

   What does Megan's work mean?

   Is it possible that Megan is right? Explain.

2. List other possible combinations of cups and counters that could be in the bag.

3. Why is it impossible for there to be 5 cups in the bag?

4. Why is it possible for there to be no cups in the bag?

Megan then asks Stacey another question about the SAME bag, "If the value of a cup is 4, what is the value of your bag?" Stacey replies, "If the value of the cup is 4, then the value of the bag is 16." Megan says, "I know the contents of your bag!"

5. What is in the bag? How does Megan know?

6. Why do you think the game is called the "Input-Output Game"?

THE INPUT-OUTPUT GAME

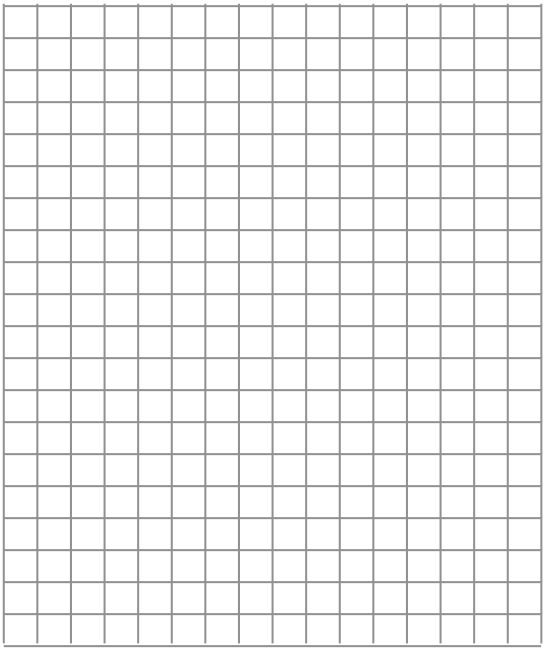
Record, graph, and write a rule for each round of the input-output game.

Round # _____		
Input (x) (value of cup)	Output (y) (total value)	Possible Combinations

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____

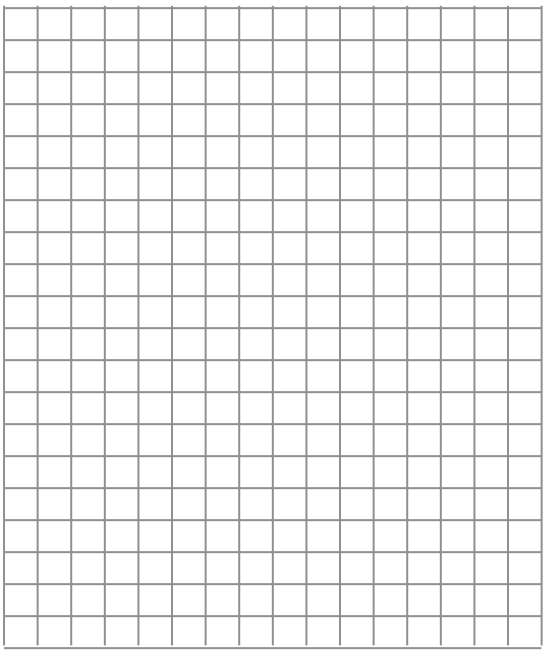


Round # _____		
Input (x) (value of cup)	Output (y) (total value)	Possible Combinations

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____



THE INPUT-OUTPUT GAME (Continued)

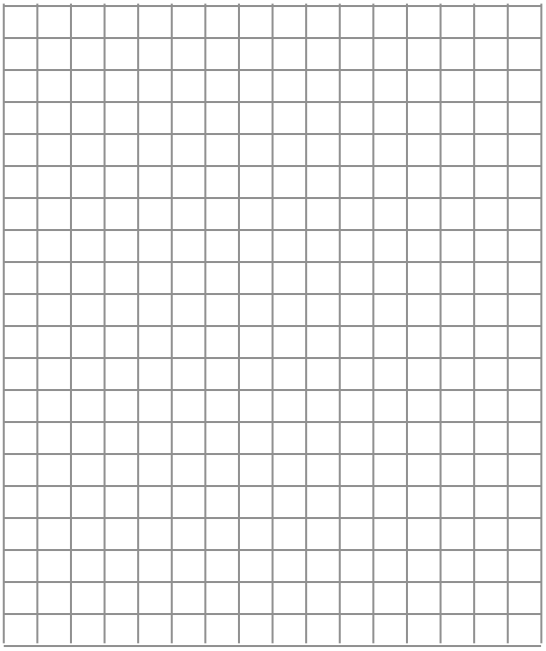
Record, graph, and write a rule for each round of the input-output game.

Round # _____		
Input (x) (value of cup)	Output (y) (total value)	Possible Combinations

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____

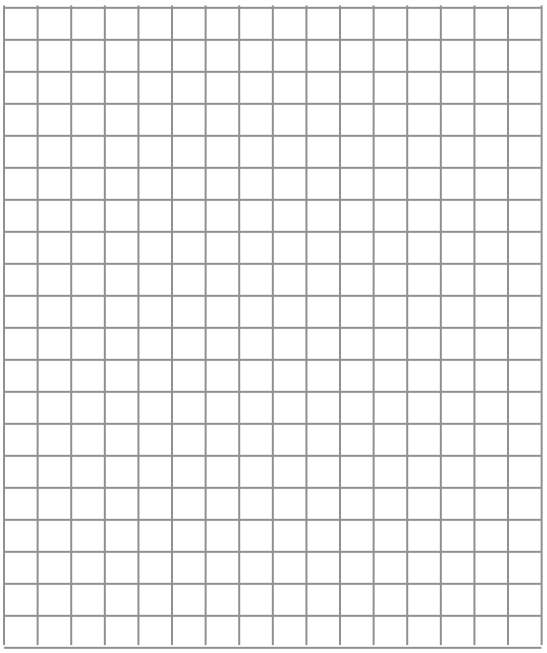


Round # _____		
Input (x) (value of cup)	Output (y) (total value)	Possible Combinations

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____



THE *Y*-INTERCEPT

Refer to the graphs on the previous pages. If you have not already done so, find the value of *y* when *x* = 0 and graph those coordinates.

1. Where does each of these points lie on the graphs?

2. Why do you think the *y*-coordinates of these points are all called *y*-intercepts?

For problem 3 below, the function is given. Complete the table and draw its graph. For problem 4 below, the graph is given. Find the function rule and complete the table. State the slope and *y*-intercept for both functions.

3. $y = 3x + 2$

x	*y*
-2	
-1	
0	
1	
2	

slope:

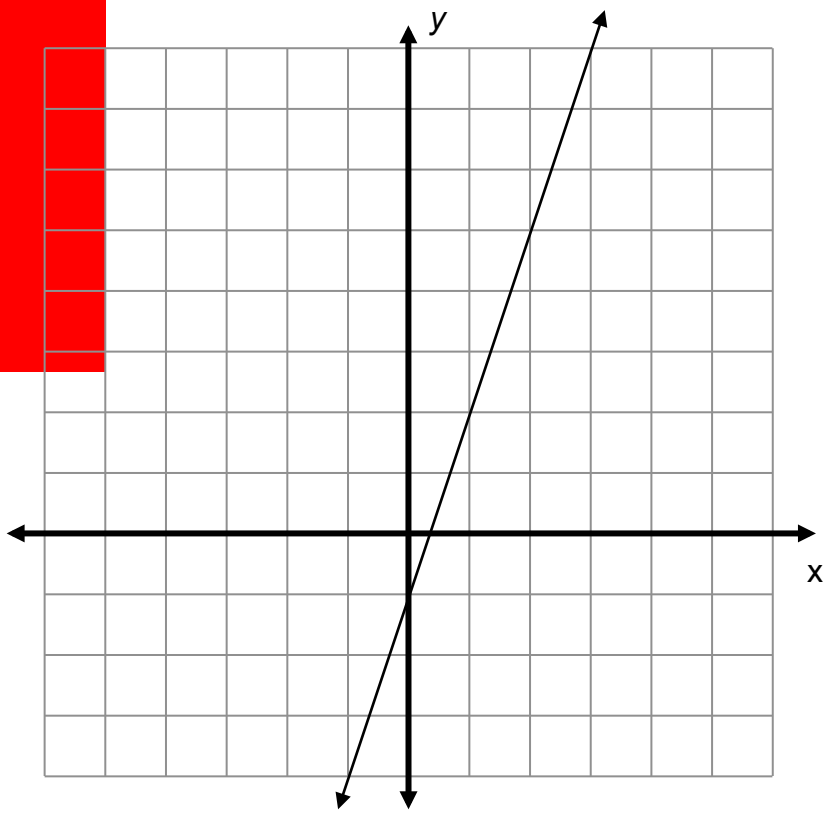
y-intercept:

4.

x	*y*
-2	
-1	
0	
1	
2	

slope:

y-intercept:



Use the equations, tables, and graphs to explain the following.

5. How are these functions the same?	6. How are these functions different?

INPUT-OUTPUT PRACTICE

Steven and Miguel were playing the input-output game with no more than 10 pieces in each bag. They recorded the following input-output tables. Determine what is in each bag, and graph the equation of the line.

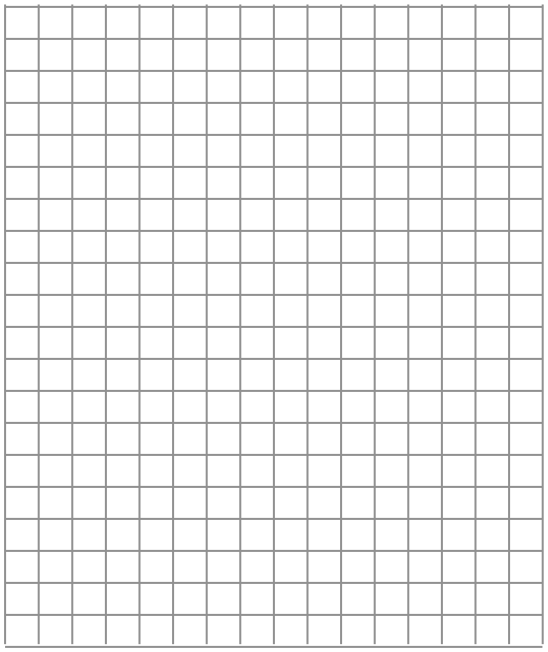
Round #1

Input (x) (value of cup)	Output (y) (total value)	Possible Equations
0 1 2 3	6 9 12 15	

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____



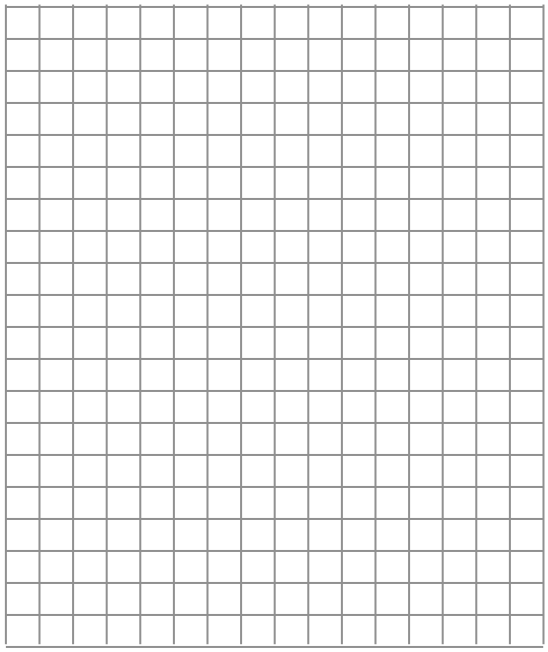
Round #2

Input (x) (value of cup)	Output (y) (total value)	Possible Equations
0 1	8 10	

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____



INPUT-OUTPUT PRACTICE (Continued)

Steven and Miguel were playing the input-output game with no more than 10 pieces in each bag. They recorded the following input-output tables. Determine what is in each bag, and graph the equation of the line.

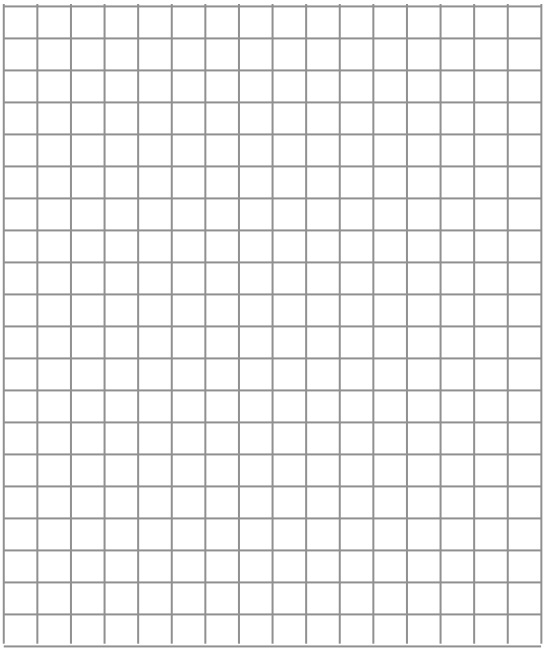
Round #3

Input (x) (value of cup)	Output (y) (total value)	Possible Equations
1 3 5	9 27 45	

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____



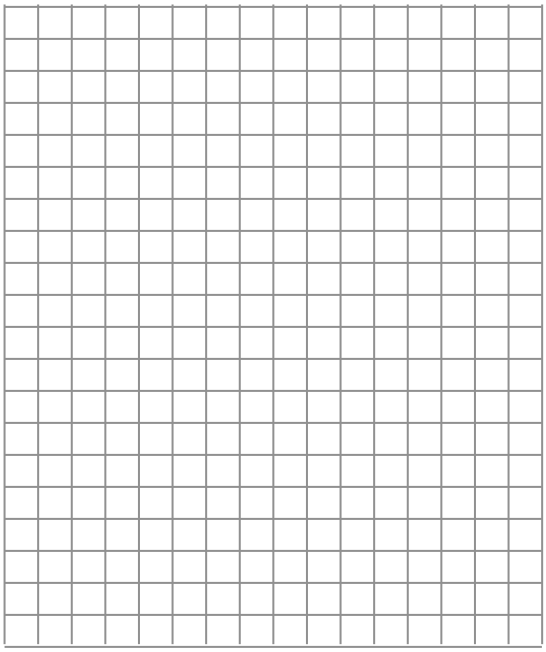
Round #4

Input (x) (value of cup)	Output (y) (total value)	Possible Equations
0 2 4	1 11 21	

Correct equation: _____

Value of y if $x = 0$: _____

Slope of the line: _____



INPUT-OUTPUT CHALLENGE

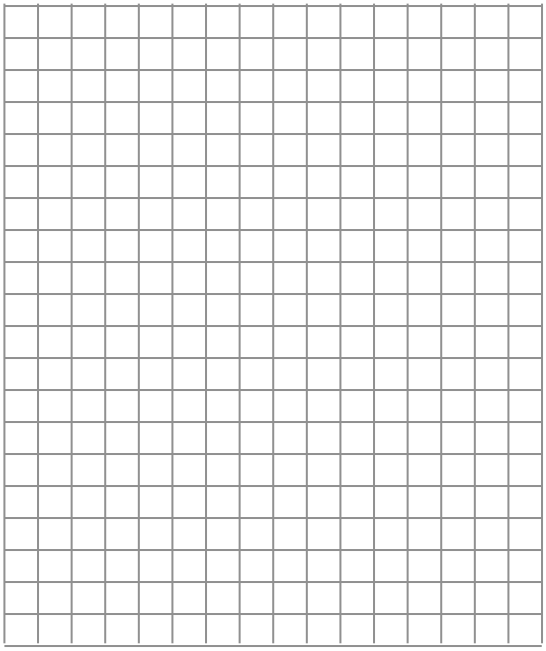
Steven challenged Miguel to a different input-output game. One boy makes up a table of inputs and outputs that fit a rule, and the other finds the rule and graphs the equation. The tables they created are below. Find their rules, graph the equations, and answer the questions.

Round #1

Input (x) (value of cup)	3	2	1	0	-1	-2	-3
Output (y) (total value)	9	4	1	0	1	4	9

Correct equation:

What's different about this table, rule, and graph compared to the ones from previous games?

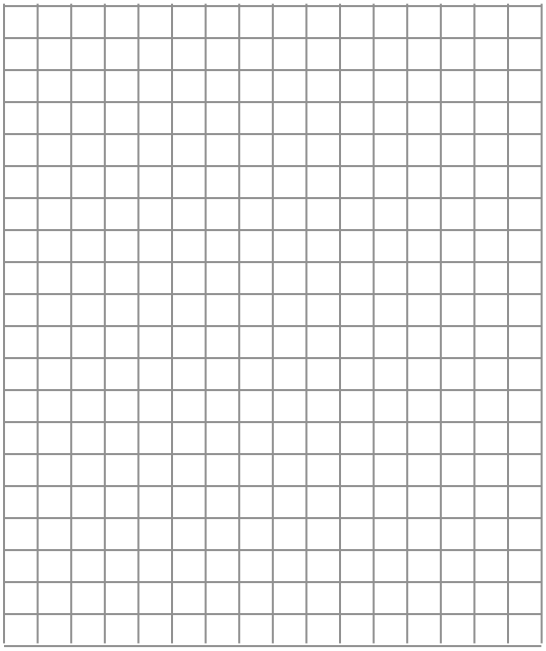


Round #2

Input (x) (value of cup)	3	2	1	0	-1	-2	-3
Output (y) (total value)	27	8	1	0	-1	-8	-27

Correct equation:

What's different about this table, rule, and graph compared to the ones from previous games?



SLOPE-INTERCEPT FORM

Summary (Ready)

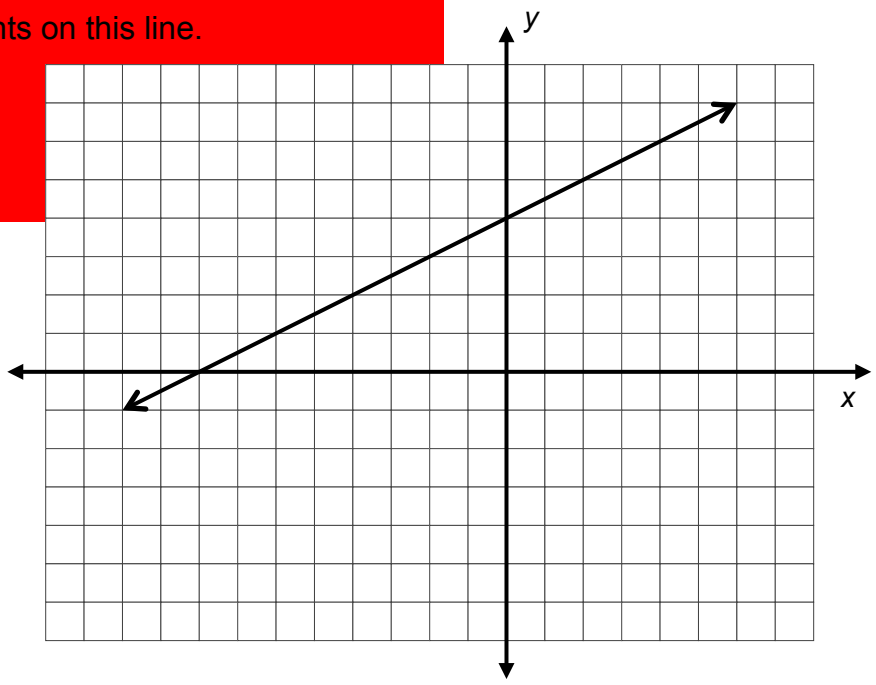
We will find equations of lines in slope-intercept form. We will extend the meaning of slope to horizontal and vertical lines. We will use properties of parallel lines and similar triangles to deepen our understanding of the meaning of slope of a line.

Goals (Set)

- Graph lines.
- Interpret the slope of a line.
- Find equations of lines.

Warmup (Go)

Label some points on this line.



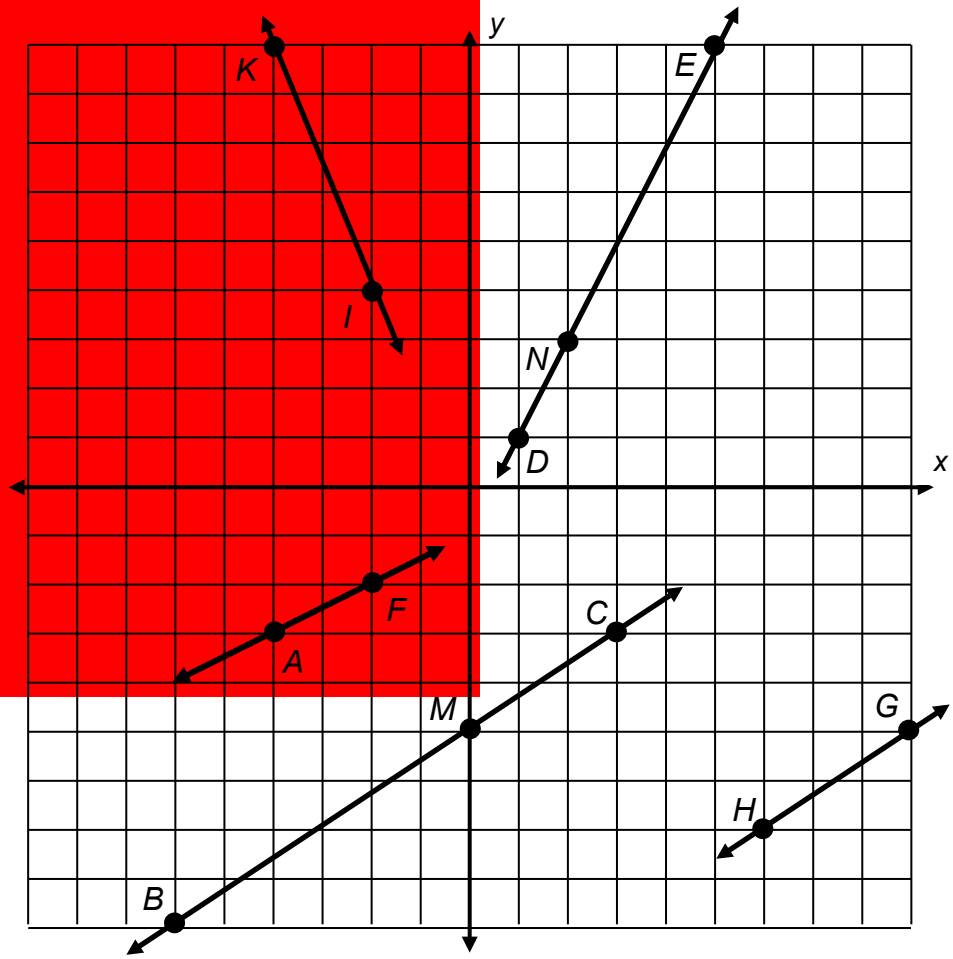
1. When $x = 0$, then $y =$ _____. This is called the _____.

2. Select two points on the line. Find the $\frac{\text{difference in the y-coordinates}}{\text{difference in the x-coordinates}}$ as you move from one point to another.

This is called the _____.

FINDING EQUATIONS OF LINES

1. Write the coordinates next to the labeled points.



Slope-intercept form of a line: _____

2. For Line *AF*

Slope: _____

y-intercept: _____

Equation: _____

FINDING EQUATIONS OF LINES (Continued)

Find the slope, the *y*-intercept, and the equation in slope-intercept form for these lines from the previous page.

3. Line *BC* Slope: _____ *y*-intercept: _____ Equation: _____	4. Line *DE* Slope: _____ *y*-intercept: _____ Equation: _____
5. Line *IK* Slope: _____ *y*-intercept: _____ Equation: _____	6. Line *HG* Slope: _____ *y*-intercept: _____ Equation: _____

FINDING MORE EQUATIONS

- Graph a line that fits each of these descriptions.
- Find the slope, the *y*-intercept, and the equation of each line in slope-intercept form.
- Use your equation to determine if a particular point lies on the line.
- Find the *x*-intercept (the point where the graph crosses the *x*-axis, or *x*-value when *y* = 0).

1. Graph the line that goes through the origin and the point (5, 6).

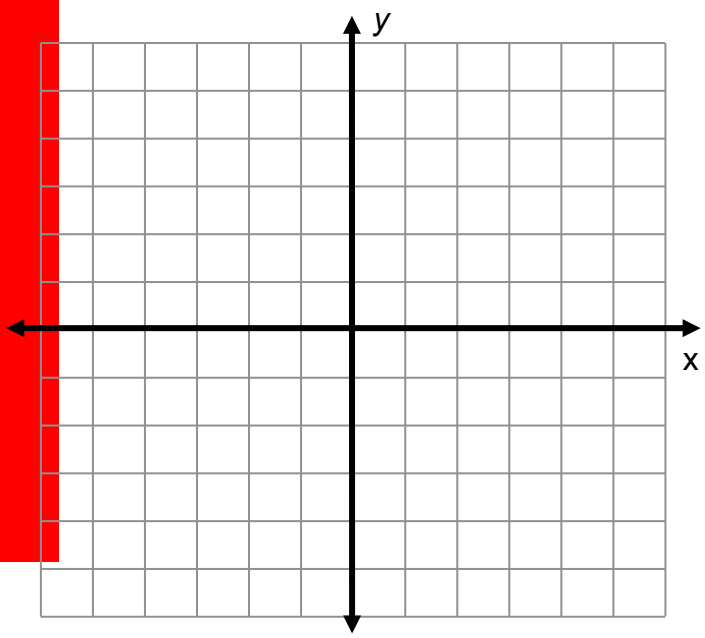
   Slope: _____

   y-intercept: _____

   Equation: _____

   Use your equation to show that the point (-5,-6) lies on the line.

   x-intercept: _____



2. Graph the line that goes through (-1, 2) and has a slope of 2.

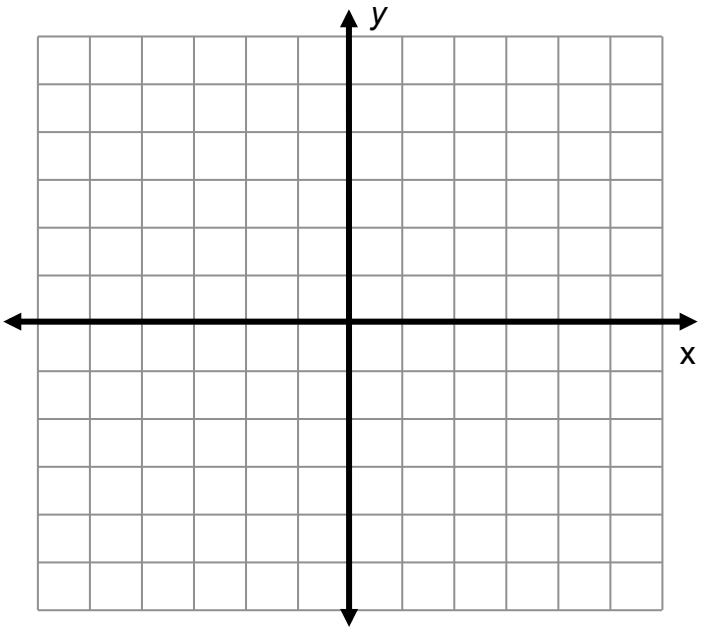
   Slope: _____

   y-intercept: _____

   Equation: _____

   Use your equation to show that the point (1, 2) does not lie on the line.

   x-intercept: _____



FINDING MORE EQUATIONS (Continued)

- Graph a line that fits each of these descriptions.
- Find the slope, the *y*-intercept, and the equation of each line in slope-intercept form.
- Use your equation to determine if a particular point lies on the line.
- Find the *x*-intercept.

3. Graph the line that goes through the points (2, 1) and (-2, 3).

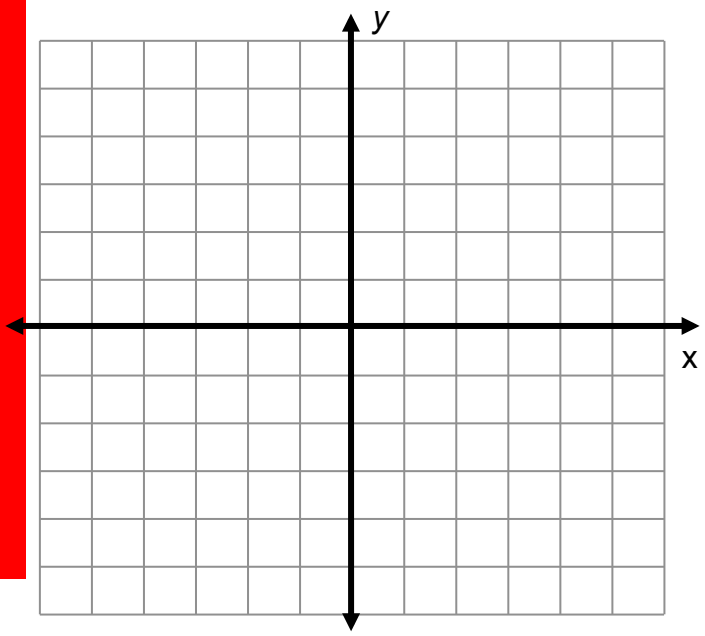
   Slope: _____

   y-intercept:_____

   Equation: _____

   Use your equation to show that the point (2, 4) does not lie on the line.

   x-intercept:_____



4. Graph the line that has intercepts (0, -1) and (-4, 0).

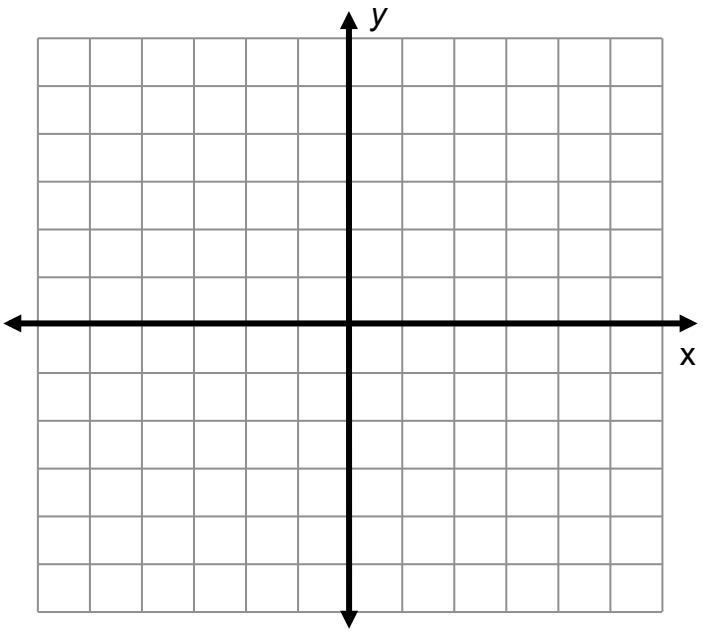
   Slope: _____

   y-intercept:_____

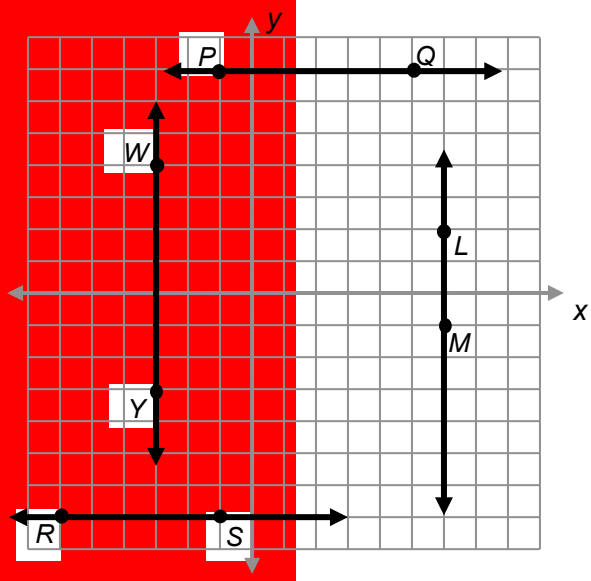
   Equation: _____

   Use your equation to show that the point (4,-2) lies on the line.

   x-intercept:_____



HORIZONTAL AND VERTICAL LINES



Line	Two points on the line	*x*-intercept	*y*-intercept	slope	equation
1. $\overleftrightarrow{PQ}$	(___, ___) (___, ___)				$y =$
2. $\overleftrightarrow{WY}$	(___, ___) (___, ___)				$x =$
3. $\overleftrightarrow{LM}$	(___, ___) (___, ___)				
4. $\overleftrightarrow{RS}$	(___, ___) (___, ___)				

5. What is the slope of a horizontal line?_____. Can you write the equation of a horizontal line in slope-intercept form? _____ Explain.

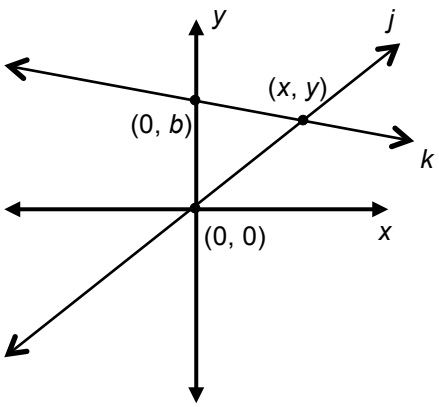
6. What is the slope of a vertical line?_____. Can you write the equation of a vertical line in slope-intercept form? _____ Explain.

DERIVING EQUATIONS OF LINES

1. Solve for y. $3 = \frac{y-4}{x}$

2. Find the slope of a line that goes through the points (f, g) and (c, d).

Use the graph at the right for problems 3-8.



3. Line j goes through the origin and a point (x, y).

   Its y-intercept is _____

4. Use the two points given on line j to find its slope (m), and solve this slope equation for y.

$$m = \frac{y - \square}{x - \square}$$

5. The equation of a line with a y-intercept of zero is represented by

   $y =$ _____.

6. Line k goes through the points $(0, b)$ and (x, y). Its y-intercept is _____.

7. Use the two points given on line k to find its slope (m), and solve this slope equation for y.

$$m = \frac{y - \square}{x - \square}$$

8. The equation of a line whose y-intercept is at $y = b$ is represented by

   $y =$ _____.

SKILL BUILDERS, VOCABULARY AND REVIEW

SKILL BUILDER 1

Write all the steps used to solve the equations. Provide justifications/explanations for each step. Use pictures as needed.

1.

Equation/Steps	What did you do? (include the property used)
$x-2x-5=3(x+5)$	given equation

Check your solution using substitution:

2.

Equation/Steps	What did you do?
$-2x=-6-x+3$	

Check your solution using substitution:

SKILL BUILDER 2

Write YES below each table, set of ordered pairs, or graph that could represent a function. Below those that could not represent a function, write NO and explain why not.

1.

x	*y*
1	1
3	3
5	5
7	7
9	9

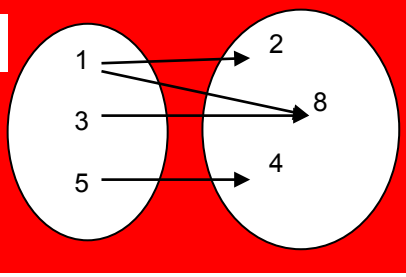
2.

x	*y*
3	1
5	7
1	9
3	5
9	7

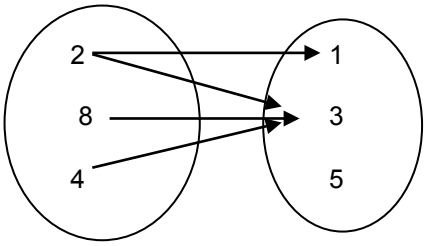
3. (0, 2), (1, -2), (2, 2), (3, -2)

4. (1, -2), (-2, 1), (-1, -2), (2, 1)

5.



6.



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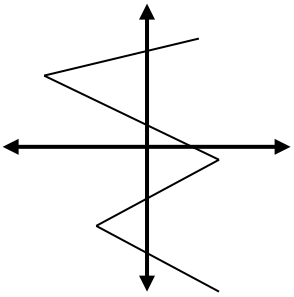
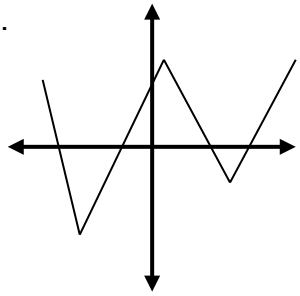
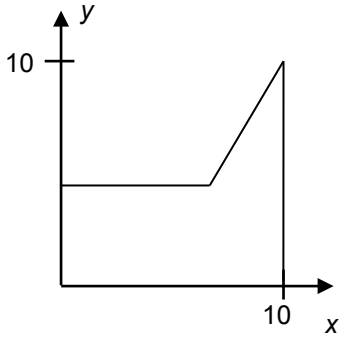


8.



9. Make up reasonable *x* and *y* values for the graph. Could this graph represent a function? Explain.

x	*y*

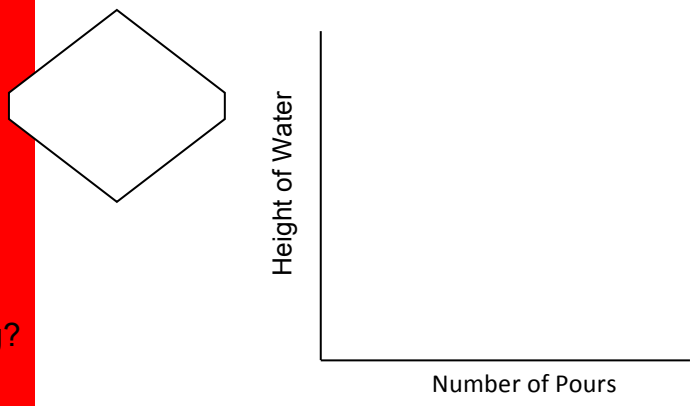


SKILL BUILDER 3

1. Suppose you poured water into this container at a constant rate.
   a. Sketch a graph of the height of the water as a function of the number of pours.
   b. Justify your sketch.

   c. Is this graph increasing or decreasing?

   d. Is this graph linear or nonlinear?



Without plotting the ordered pairs, match each input-output table with a graph below. Write one or two sentences to justify each choice.

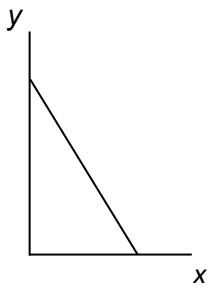
2. Graph: _____
   Explain:

Input (x)	Output (y)
0	13
1	11
2	9
3	7
4	5
5	3
6	1

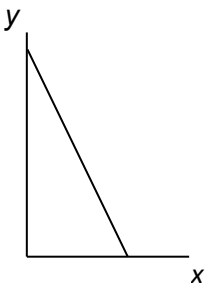
3. Graph: _____
   Explain:

Input (x)	Output (y)
0	19
1	16
2	13
3	10
4	7
5	4
6	1

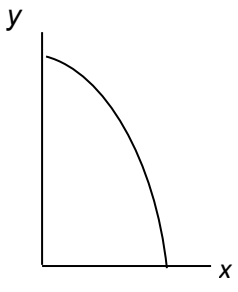
A.



B.



C.



4. For graphs A, B, and C above,
   a. which, if any, are nonlinear? _____
   b. which, if any, are decreasing? _____

SKILL BUILDER 4

TOILET PAPER EMPORIUM
4 rolls for $1.60

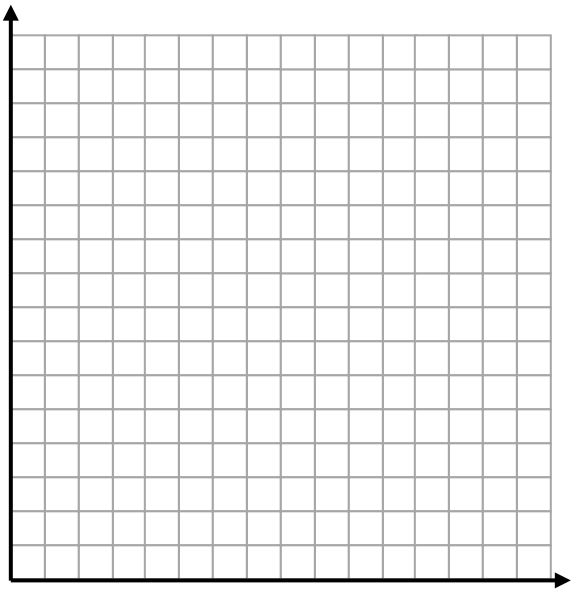
HOUSE OF TOILET PAPER
6 rolls for $2.64

1. Make tables of values for number of rolls (x) and cost (y). Assume a proportional relationship.

TOILET PAPER EMPORIUM	
# of rolls (x)	Cost (y)
4	
8	

HOUSE OF TOILET PAPER	
# of rolls (x)	Cost (y)
6	

2. Which shop has the better buy? Use entries in the table to explain your reasoning.



3. Make a graph. Label and scale the grid. Explain which graph illustrates a slower rise in price.

4. Find the unit rates for one roll of toilet paper at each store. Use these numbers to explain which store has the better buy.

   For Toilet Paper Emporium, this corresponds to the ordered pair (1, _____)

   For House of Toilet Paper, this corresponds to the ordered pair (1, _____).

5. Identify the coordinates when $x = 0$ and explain what they represent in the context of the problem.

6. Write equations that relate the number of rolls (x) to the cost (y).

   TOILET PAPER EMPORIUM y = _____ HOUSE OF TOILET PAPER y = _____

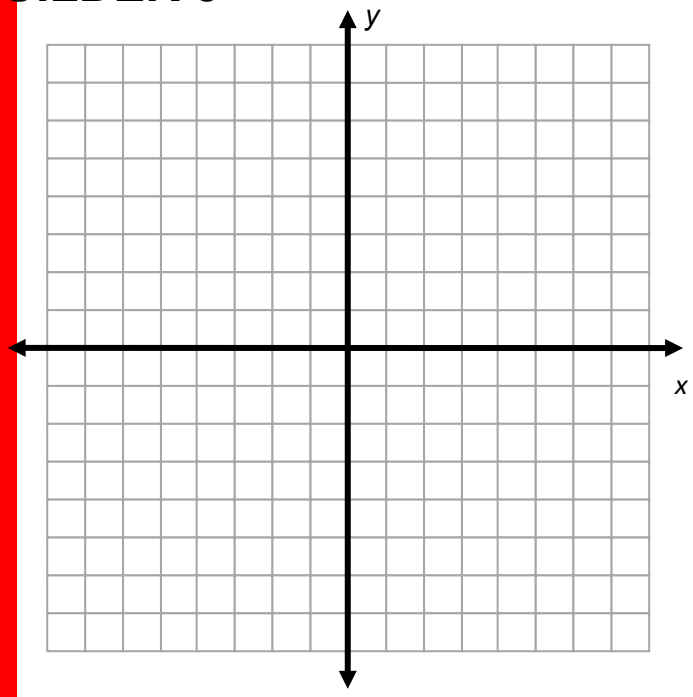
SKILL BUILDER 5

1. Graph each set of ordered pairs. Label the two points and draw a line through them.

   Set 1: *A* (5, 1) and *B* (-1, -1)

   Set 2: *G*(-5, 4) and *H* (-3, -4)

   Set 3: *K* (2, 3) and *L* (-3, 3)



		Find the slope by counting.	Use the slope formula to calculate the slope in two different ways.	
2.	Line *AB*		$\frac{(1)-(-1)}{(5)-(-1)} =$	$\frac{(-1)-(1)}{(-1)-(5)} =$
3.	Line *GH*			
4.	Line *KL*			

Solve each equation.

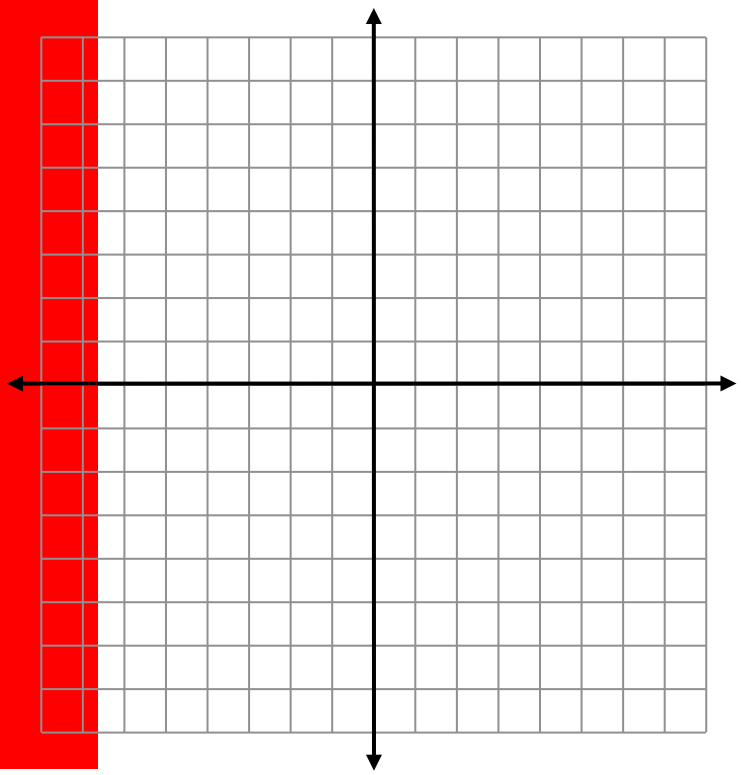
5. $2.5x - 6 = -4 - 3.5x$	6. $3(x - 2.1) = 2(x + 1.2)$	7. $\frac{x}{8} = \frac{9}{12}$

SKILL BUILDER 6

1. Draw a line through point *A* (1, 2) with a slope of $\frac{2}{1}$.
   What is the *y*-intercept? _____

2. Draw a line through point *B* (-2, -2) with a slope of $\frac{-1}{3}$.
   What is the *x*-intercept? _____

3. Draw a line through point *C* (4, 4) with a slope of $\frac{1}{4}$. Name a point on this line that is in the 2nd quadrant.



Given each set of ordered pairs, use the slope formula to find the slope of the line that goes through them.

4. *S*(5, 4) and *T*(2, 3)

5. *U*(2, 10) and *V*(5, 1)

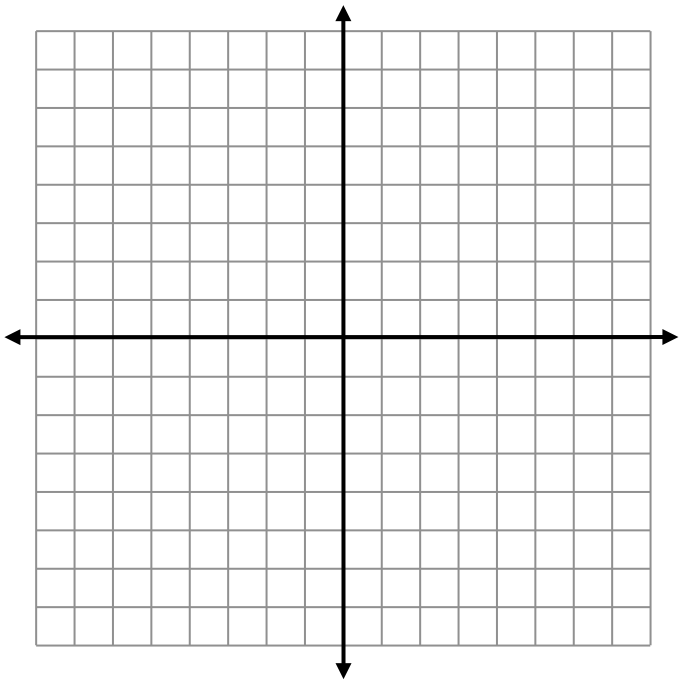
6. *W*(10, 16) and *X*(-2, -4)

7. *Y*(-5, -8) and *Z*(0, -12)

SKILL BUILDER 7

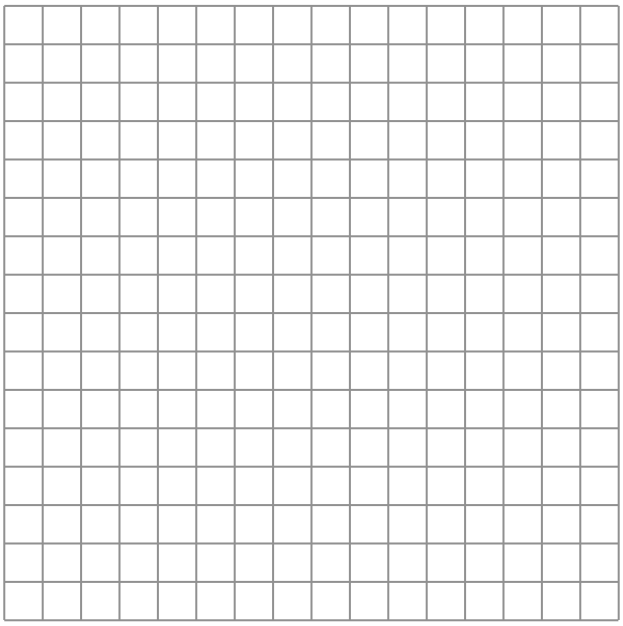
For 1 and 2, complete the tables and graph the equations.

1. Two points on the line	(4, -2) and (-4, 0)
Slope	
y-intercept	
Equation of the line in the form $y = mx + b$	



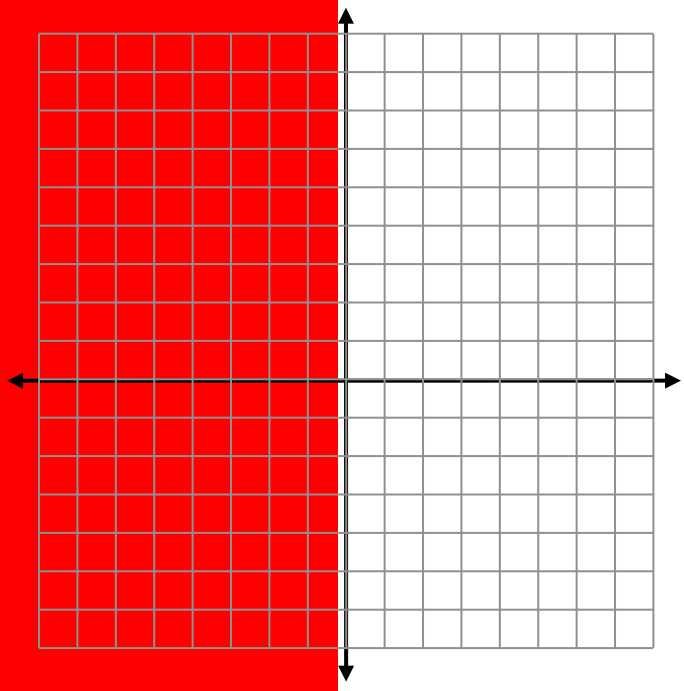
2. Two points on the line	(-2, -3) and (1, -6)
Slope	
y-intercept	
Equation of the line in the form $y = mx + b$	

3. There are four quarts in a gallon. Make a table of values that shows gallons (x) and the equivalent number of quarts (y). Find an equation that can be used to convert gallons to quarts. Make a graph of the equation.



Does connecting the points with a line make sense? Explain.

SKILL BUILDER 8



Draw the following lines on the coordinate axes above. Then fill in the table.

two points on the line	slope	*y*-intercept	*x*-intercept	equation of the line in slope-intercept form
1. (-3, 1) (1, 5)				
2. (-3, 9) _____		0		
3. (-2, 4) _____	1			
4. _____ _____	$-\frac{1}{2}$	2		
5. (-3, -1) (6, -4)				

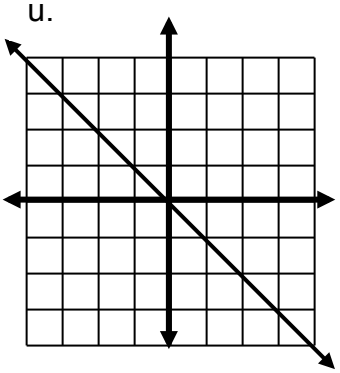
SKILL BUILDER 9

- Match each equation to one set of ordered pairs and also to one graph.
- Circle the equation(s) with the greatest slope.
- Box the equation(s) with the least slope.

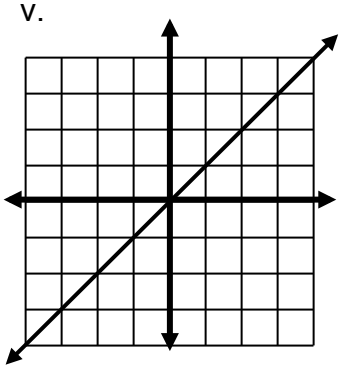
Equation	Ordered pairs	Graph
1. $y = x$		
2. $y = 4x$		
3. $y = x + 2$		
4. $y = 4x - 2$		
5. $y = -x$		
6. $y = -x + 2$		

A. (0, -2) (1, 2) (-1, -6)	B. (0, 2) (1, 3) (-1, 1)
C. (0, 0) (1, 4) (-1, -4)	D. (0, 0) (1, 1) (-1, -1)
E. (0, 2) (1, 1) (-1, 3)	F. (0, 0) (1, -1) (-1, 1)

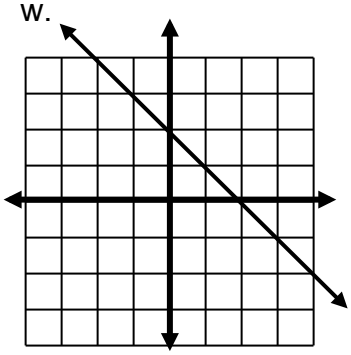
u.



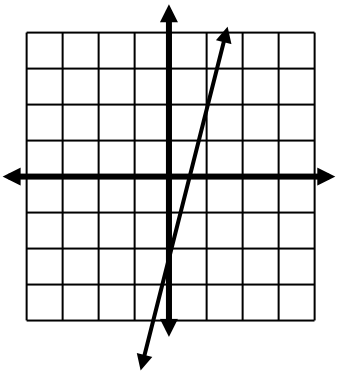
v.



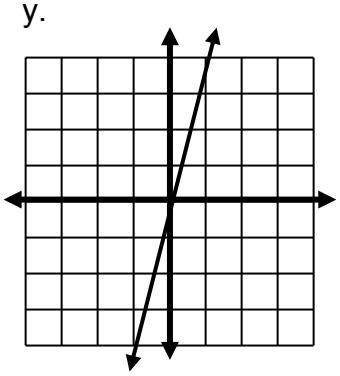
w.



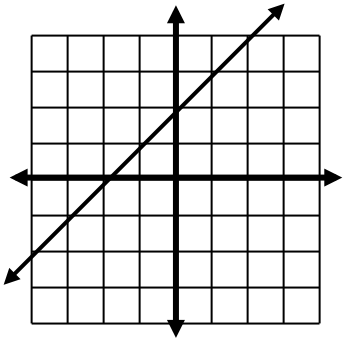
x.



y.



z.



SKILL BUILDER 10

1. Solve for x: $\frac{x}{4.2} = \frac{4.2}{10}$

2. Fill in the table for the equation $2x + 4y = 12$.
Could this rule represent a function?_____ Explain.

x		2		-2	-4
y	3		5		

Write a step that shows how to use mathematical properties to transform the original equation into its equivalent equation in slope-intercept form.

3. $2x + y = -3$ $y = -2x - 3$	4. $\frac{1}{4}y = x - 3$ $y = 4x - 12$

Rewrite each equation as an equivalent equation in slope-intercept form, $y = mx + b$, by isolating y.

5. $x + y = -2$	6. $2x + 6y = -12$
7. $-3x - 6 = y$	8. $2(x - y) = 4$

FOCUS ON VOCABULARY

Use vocabulary in the word bank and throughout this packet to complete each sentence.

1. To find the _____ _____ ____ _____, find the change in the *y*-value and divide by the change in *x*-value.

2. (3, -5) is an _____ _____, which labels the point on a coordinate plane with *x*-coordinate 3 and *y*-coordinate -5.

3. The _____ – _____ of the linear function $y = 3x + 6$ is 6 and is located on the graph at the point (0, 6).

4. A _____ function has an equation that can be written in the form $y = mx + b$.

5. A horizontal line has a slope of _____.

6. A line that goes through the second and fourth quadrants has a _____ slope.

7. A line that goes through the first and third quadrants has a _____ slope.

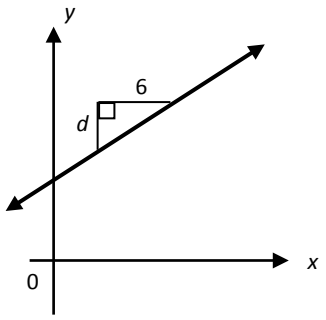
8. Below is a table of values of a function. The _____ – _____ form of the equation for this function is $y = 3x + 1$.

input	1	2	3	4	5	6	*x*
output	4	7	10	13	16	19	$3x + 1$

SELECTED RESPONSE

Show your work on a separate sheet of paper and choose the best answer.

1. The slope of the line shown is $\frac{1}{2}$. What is the value of d?



A. 2 B. 3

C. 4 D. 6

2. Find the slope of the line through the points (0, 3) and (-5, 0).

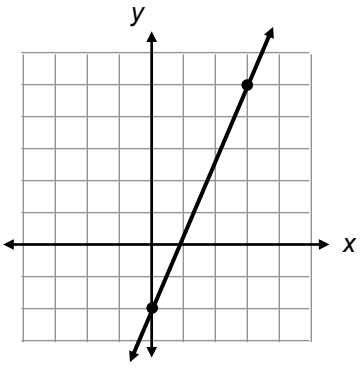
A. $\frac{3}{5}$ B. $-\frac{3}{5}$ C. $\frac{5}{3}$ D. $-\frac{5}{3}$

3. Which of the following best describes the slope of the line through the points (-3, 2) and (-3, -3)?

A. Positive slope B. Negative slope

C. Zero slope D. No slope

4. What is the equation of this line?



A. $y = \frac{7}{3}x - 2$ B. $y = -\frac{7}{3}x + 2$

C. $y = -\frac{3}{7}x - 2$ D. $y = \frac{3}{7}x - 2$

5. Which of these equations represents the line through the points (-5, 13) and (5, 3)?

A. $y = -x - 8$ B. $y = x + 8$ C. $y = x - 8$ D. $y = -x + 8$

KNOWLEDGE CHECK

Show your work on a separate paper, and write your answers on this page.

8.1 Introduction to Slope

1. Find the slope of the line that passes through (2, 3) and (-2, 4).

2. Draw a line through the point (4, -2) with a slope of $\frac{-5}{2}$.

8.2 Input-Output Investigation

3. Zarmina and Okwe were playing the input-output game with no more than 10 pieces in the bag. Find the slope and equation of a line that represents the contents in the bag.

Input (x) (value of stick)	Output (y) (total value)
0	8
1	10
2	12

Slope: _____

y-intercept: _____

Equation: y = _____

8.3 Slope Intercept Form

Find the equation of each line in slope-intercept form.

4. A line through the point (-1, -1) with a slope of 3.

5. A line with an x-intercept of -2 and a y-intercept of -4.

HOME-SCHOOL CONNECTION

Here are some questions to review with your young mathematician.

1. Find the slope of the line that passes through (9, 8) and (-3, 5).

2. Althea and Gloria were playing the input-output game with no more than 10 cups and/or counters in the bag. Find the slope and equation of a line that represents the contents in the bag.

Input (x) (value of cup)	Output (y) (total value)
0	5
2	7
-1	4

Slope: _____

y-intercept: _____

Equation: y = _____

Use graph paper as needed for problems 3-4 to find the equation of each line in slope-intercept form.

3. The line through the point (0, -2) with a slope of 4.

4. The line through the points (-3, 3) and (-2, 1).

Parent (or Guardian) Signature _____

COMMON CORE STATE STANDARDS – MATHEMATICS

STANDARDS FOR MATHEMATICAL CONTENT

8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line.*

8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and the initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.EE.6 ~~Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane;~~ derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

STANDARDS FOR MATHEMATICAL PRACTICE

MP3 Construct viable arguments and critique the reasoning of others.

MP6 Attend to precision.

MP7 Look for and make use of structure.

MP8 Look for and express regularity in repeated reasoning.

9 7 8 1 6 1 4 4 5 2 1 6 4