Math 8

Unit 5 Writing Linear Equations

Unit 6 Working with Graphs

Unit 7 Systems of Equations

Name _____

Teacher _____

Period _____

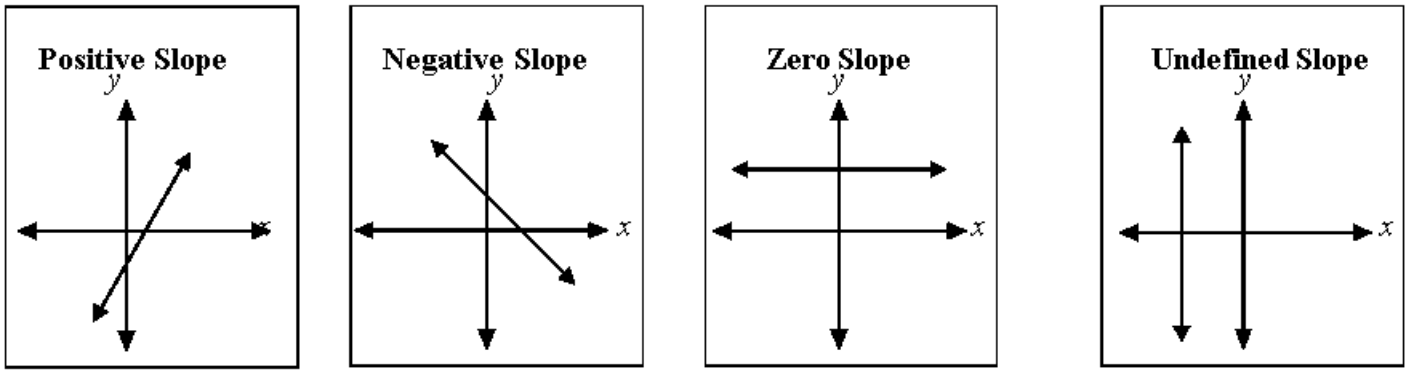
Unit 5

Writing Linear Equations

	Date	Lesson	Topic
		1	Types of slope
		2	Find slope using a formula
		3	Write an equation of a line given m and b
		4	Write an equation of a line from a graph
		5	Functions
			Quiz
		6	Comparing Rate of Change
		7	Graphing Systems of Equations One Solution, No Solution, Infinitely Many Solutions
		8	Linear vs Nonlinear
			Review
			Test

Lesson 1
Types of Slope

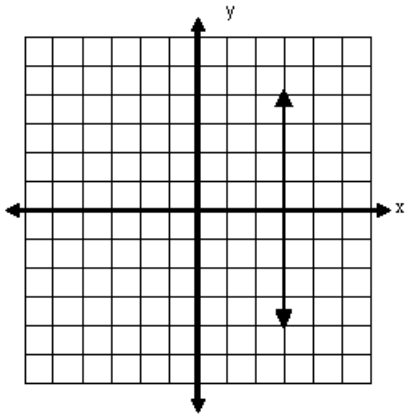
Types of slopes:



Examples:

Tell what type of slope each is

1)



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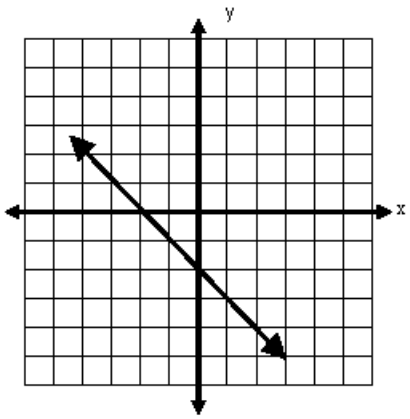

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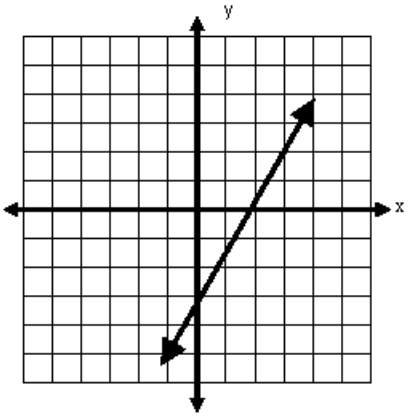

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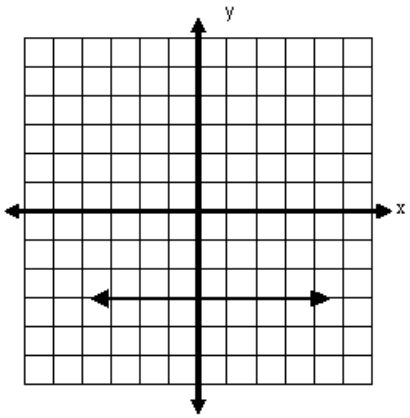
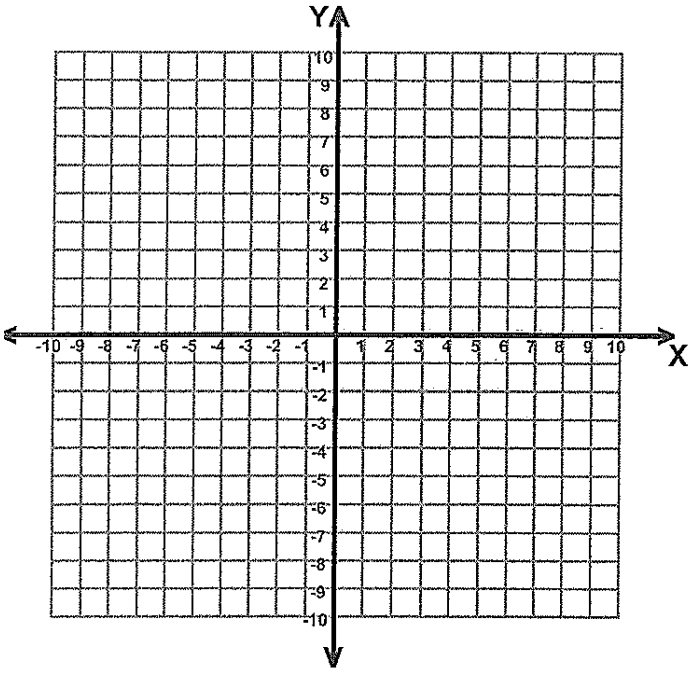
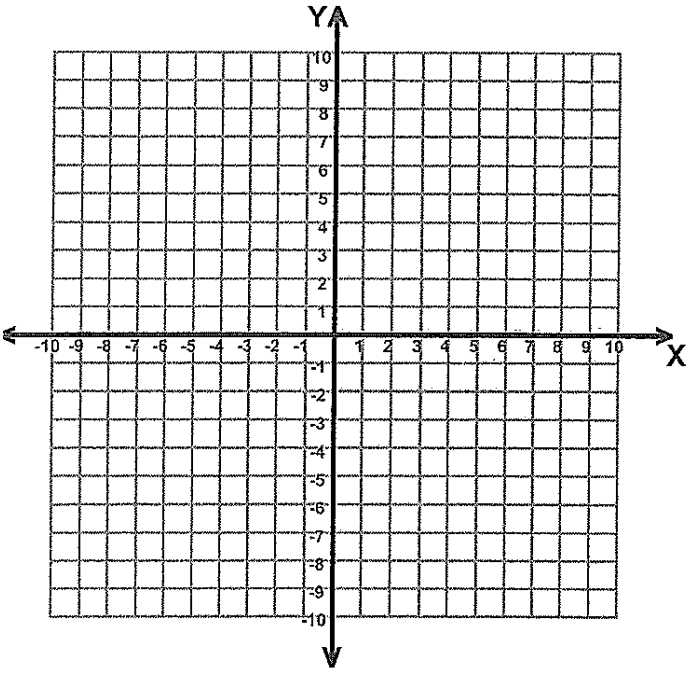


Try These: Graph each line and then tell what type of slope it is.

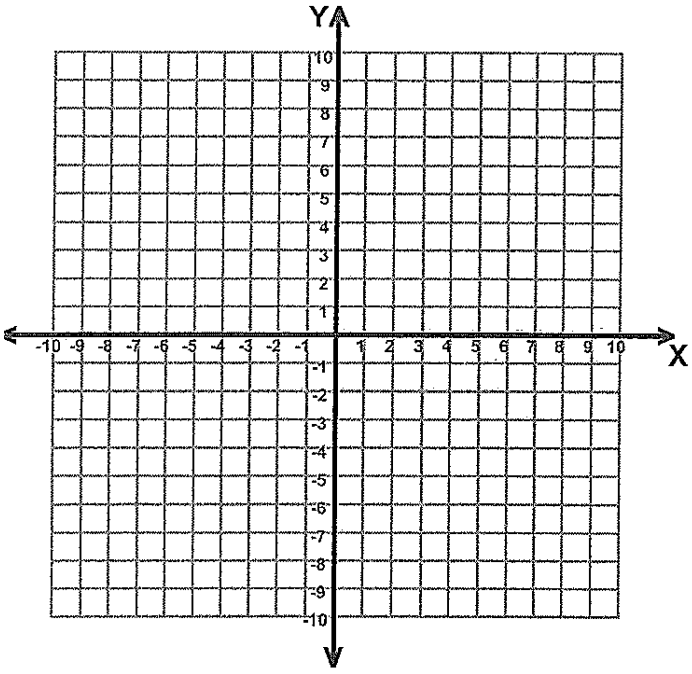
1) y = 3



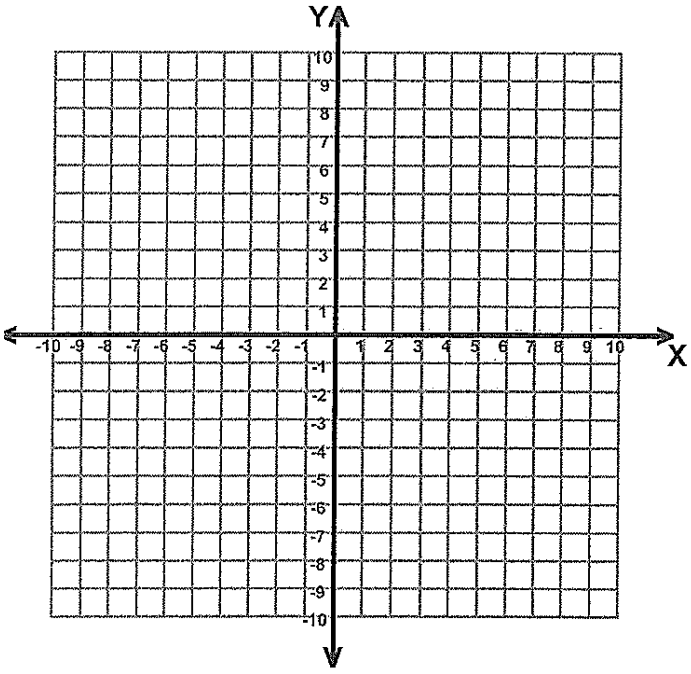
2) y = -2x + 3



3) y = x - 2



4) x = -2



Write an equation with the following slope:

5) Positive slope _____

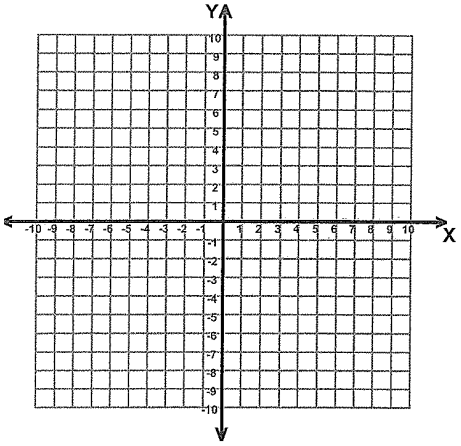
6) Zero Slope _____

7) Negative Slope _____

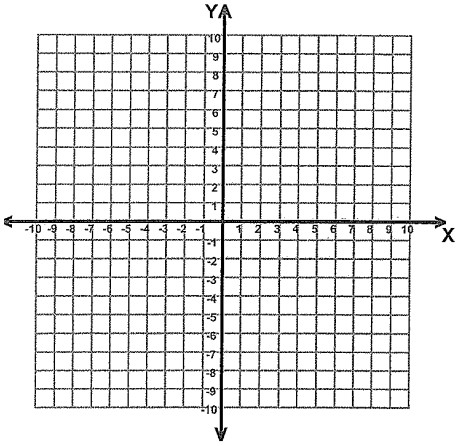
8) Undefined Slope _____

Plot and label the points, draw a line, and then tell what type of slope it is.

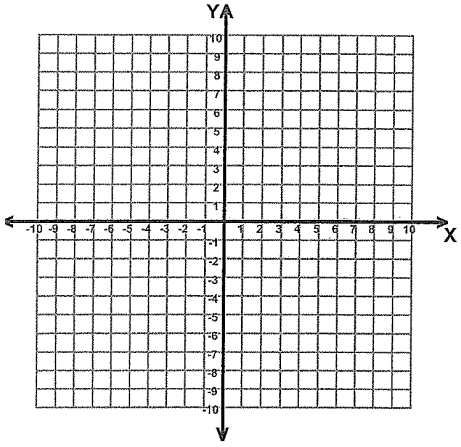
9) A (-5, 4) B (4, -3)



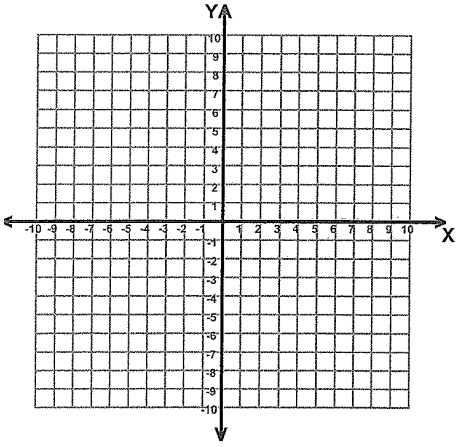
10) A (4, 3) B (4, -6)



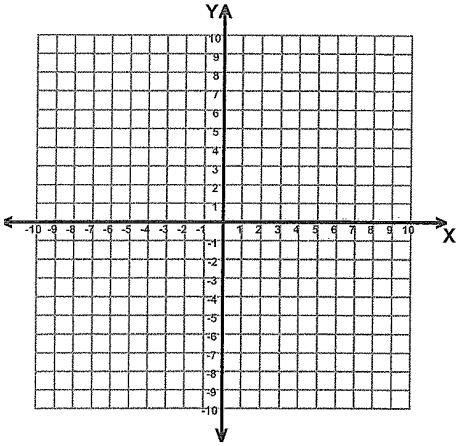
11) A (-3, -2) B (4, 4)



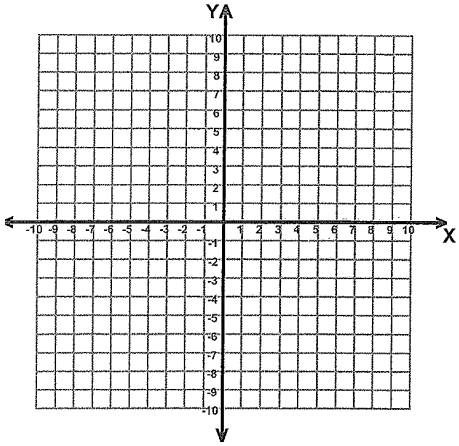
12) A (-5, -3) B (4, -3)



13) A (3, -1) B (-5, -2)

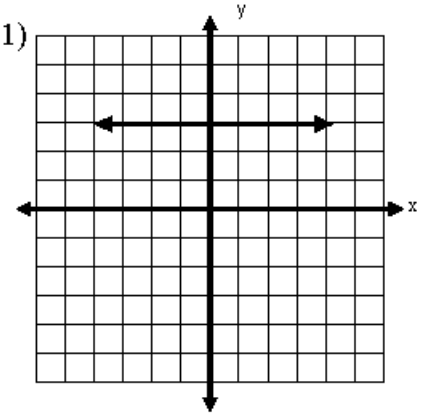


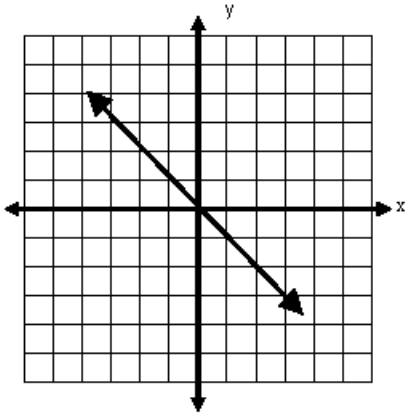
14) A (0, 5) B (-4, 5)

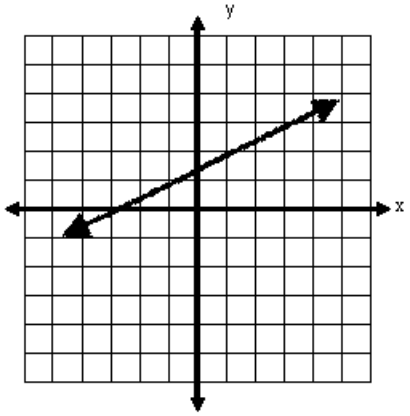


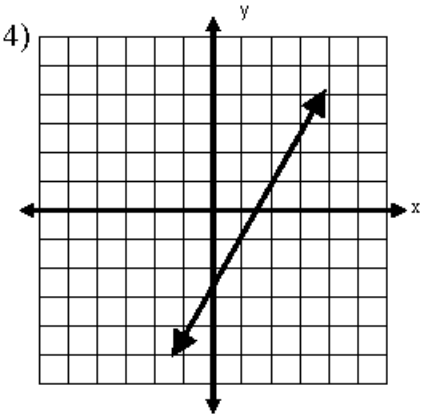
Lesson 1: Classwork/Homework

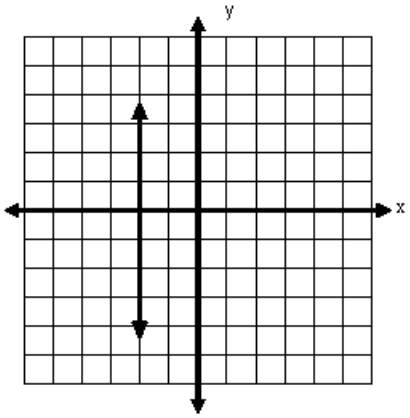
Tell what type of slope each graph represents: (Negative, Positive, Zero or Undefined)

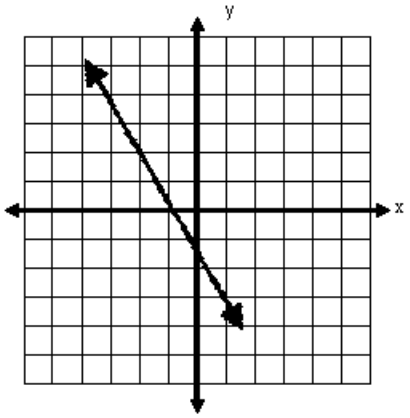
1) 

2) 

3) 

4) 

5) 

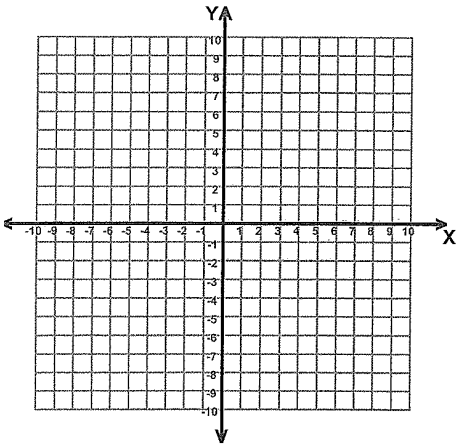
6) 

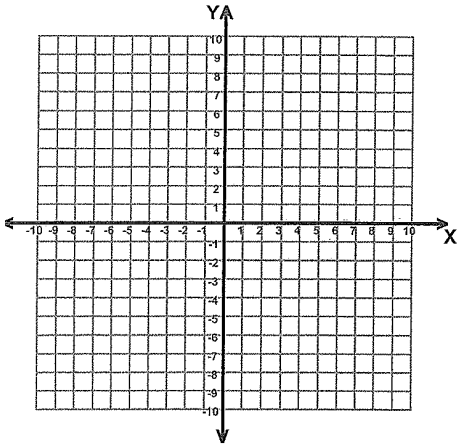
Graph each line and then tell what type of slope it is.

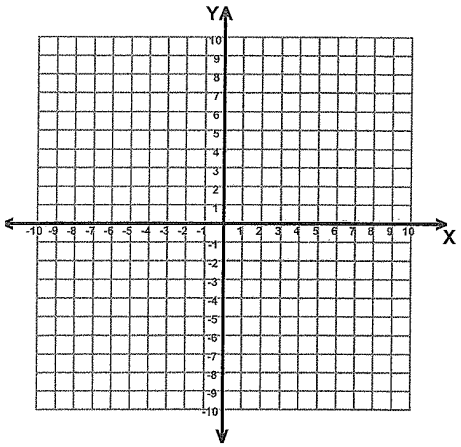
7) $y = -2$

8) $y = \frac{1}{2}x - 5$

9) $y = -2x + 4$

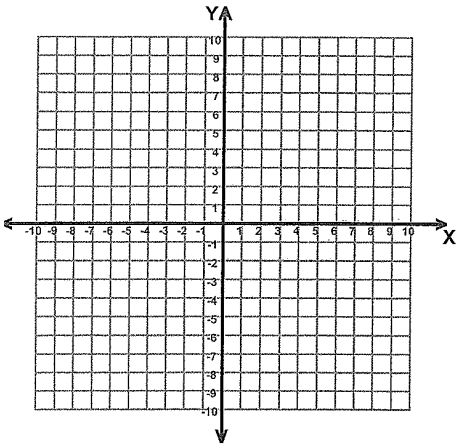




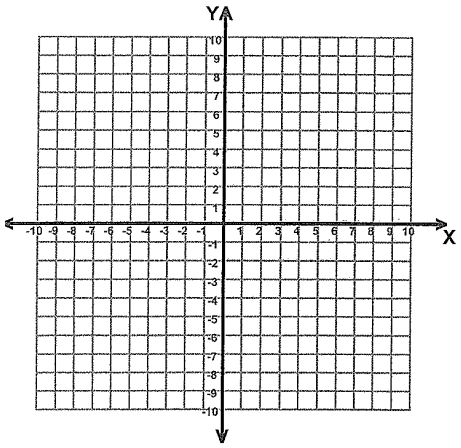


Plot and label the points, draw a line, and then tell what type of slope it is.

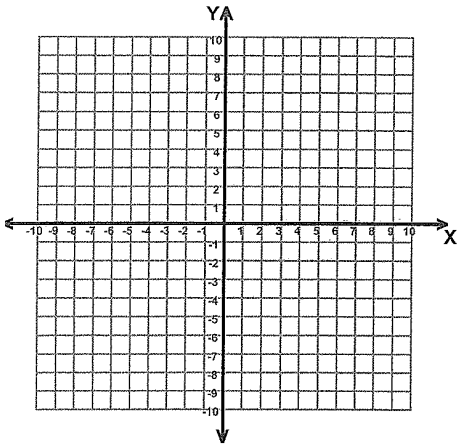
10) A (-1, 2) B (-1, -5)



11) A (4, 3) B (-4, -3)



12) A (5, -2) B (0, 4)



Review Work:

13) A rectangular section of land made up of wheat farms has a length of $5x10^4$meters and a width of $6x10^3$ meters. What is the area of the land in square meters?

A) $3x10^6\ square\ meters$ C) $3x10^7\ square\ meters$
B) $3x10^8\ square\ meters$ D) $3x10^{12}\ square\ meters$

14) Which best describes the solution for : $\frac{x}{2} - 6 = 4$

A) x = 20 C) x = 5
B) no solutions D) Infinite solutions

15) Sylvie's age is 5 years less than half Katie's age. If Sylvie is 11 years old, what is Katie's age?

A) 8 years old C) 12 years old
B) 27 years old D) 32 years old

16) What is the slope of the line whose equation is $y = \frac{1}{6}x - \frac{1}{2}$

A) $-\frac{1}{2}$ C) $\frac{1}{2}$
B) $-\frac{1}{6}$ D) $\frac{1}{6}$

17) Which shows $(2^2)^{-2}$ in standard form?

A) 0 B) $\frac{1}{16}$ C) $\frac{1}{8}$ D) 1

18) Which shows $4^6 \div 4^5$

A) 0 B) 1 C) 4 D) 16

Lesson 2
Finding Slope Using a Formula

Vocabulary:

Slope - is the ratio of the vertical change of the line (difference in y-values) to its horizontal change (difference in x-values). The ratio is a constant rate of change between any two points on the line.

Slope Formula → $\frac{\Delta y}{\Delta x}$

Slope → $\frac{\textbf{rise}}{\textbf{run}} = \frac{\Delta y}{\Delta x}$

Slope → $\frac{\Delta y}{\Delta x} = \frac{\text{Change of y}}{\text{Change of x}} = \frac{\text{the difference of the y coordinates}}{\text{the difference of the x coordinates}} = \frac{y_2 - y_1}{x_2 - x_1}$

Find the slope (rate of change) of the line containing the following points.

1) A(6,2) B(8,6)

2) A(6,3) B(-2,-5)

3) A(7,1) B(-3,5)

4) A (0, 6) and B (1, 4)

5) A (1, 1) and B (2, 4)

6) A (3, 5) and B (8, 5)

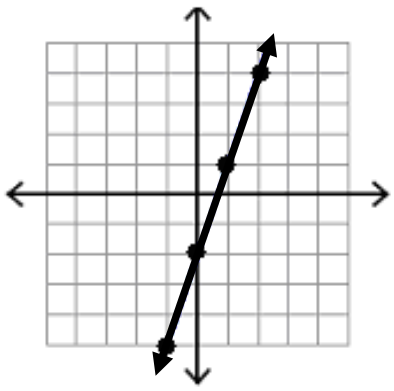
Using the table below, determine the slope (rate of change) using the slope formula.

7)

x	y
1	3
2	6
3	9
4	12

Using the graph below, determine the slope using the slope formula.

8)



Try These:

Find the slope (rate of change) of the line containing the following points.

1) P(-8,-4) Q(6,-4)

2) P(5,3) Q(5,-8)

3) P(5,9) Q(8,-3)

4) P(3,-2) Q(8,4)

5) P(5,-2) Q(8,-2)

6) P(3,4) Q(8,7)

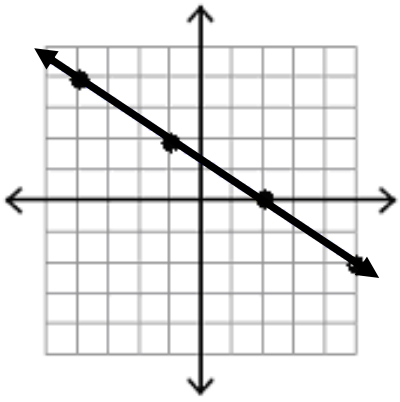
Using the table below, determine the slope (rate of change) using the slope formula.

7)

x	y
8	4
6	8
4	12
2	16

Using the graph below, determine the slope using the slope formula.

8)



Lesson 2: Classwork

Find the slope (rate of change) of the line containing the following points.

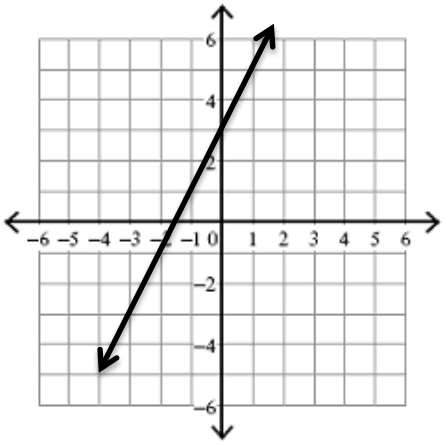
1) (-4, 3) and (4, 1)

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

3) (-8, 2), (2, -3), and (8, -6)

Using the graphs below, determine the slope using the slope formula

4)



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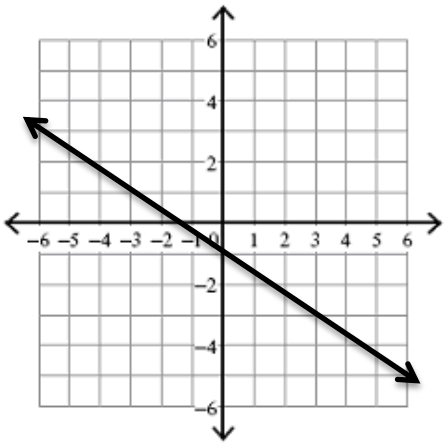


Using the tables below, determine the slope using the slope formula.

6)

x	y
2	0
4	3
6	6
8	9

7)

x	y
6	32
12	24
18	16
24	8

Lesson 2: Homework

Find the slope (rate of change) of the line containing the following points.

1) A(0,1) B(4,4)

2) A(4,7) B(8,8)

3) A(3,6) B(6,8)

4) A(4,1) B(4,9)

5) A(-2,-3) B(9,3)

6) A(5,-2) B(5,1)

7) A(4,3) B(1,9)

8) A(5,2) B(4,7)

9) A(4,8) B(4,-1)

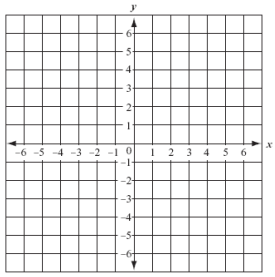
10) A(7,-1) B(-5,-4)

11) A(0,-4) B(5,-1)

12) A(-1,-2) B(-1,-5)

Directions: Step 1: Determine the slope of the line containing the two given points using the slope formula:
Step 2: Plot the two points and connect to form a straight line (remember extend, with arrows!)
Step 3: Name the type of slope that the line drawn has.

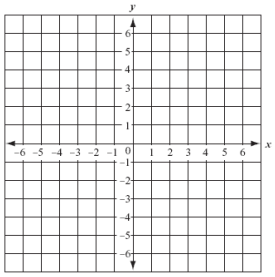
13)



(2,3) and (5,6)

Type of Slope:_____

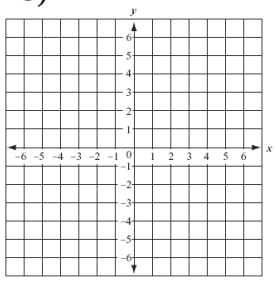
14)



(-2,-2) and (1,-2)

Type of Slope:_____

15)



(2,1) and (2,-2)

Type of Slope:_____

Directions: Using the tables below, determine the slope using the slope formula.

16)

x	y
3	6
1	8
-1	10
-3	12

17)

x	y
0	1
4	3
8	5
12	7

Review:

18) Solve for x: $-1.2 + 4x = 2x + 6.8$

19) Simplify: $13 - 15 + 8 - 1 + 4$

---

20) $3(-4)^2 - 12$

21) Solve for y: $5y - 5x = 25$

---

22) $(2x^2 - 3x + 4) + (-3x^2 - 7x - 2)$

23) What is the value of x: $\frac{4^5}{4^x} = 4^{-1}$

Lesson 3
Write an equation of a line given m and b

Do Now: Review Work

Find the slope and y-intercept of each:

1) y = 2x + 8	2) y = -4x + 3	3) y = -6x - 7	4) y = x + 2	5) y = x – 2
m = _____	m = _____	m = _____	m = _____	m = _____
b = _____	b = _____	b = _____	b = _____	b = _____
6) y = x - 6	7) y = -3x	8) y = x - 8	9) y = -x + 2	10) y = x
m = _____	m = _____	m = _____	m = _____	m = _____
b = _____	b = _____	b = _____	b = _____	b = _____

Put into y = mx + b form. Then name the slope and y-intercept of each:

11) y - 4 = 2x	12) 3 + y = x	13) -3x + y = -4	14) 2y = 4x + 6	15) -5 + 3y = 6x + 7
m = _____	m = _____	m = _____	m = _____	m = _____
b = _____	b = _____	b = _____	b = _____	b = _____

Examples: Write an equation of a line when given the slope and the y-intercept

Write the equation of a line if:

1) m = 1 b = -1	2) m = -2 b = 3	3) m = $\frac{1}{3}$ b = 6	4) m = -5 b = -2	5) m = 0 b = 4
_____	_____	_____	_____	_____
6) slope = 3 y-int = -1	7) slope = 4 y-int = 4	8) slope = -2 y-int = 6	9) slope = - 4 y-int = 0	10) slope = 1 y-int = -5
_____	_____	_____	_____	_____

Find the slope (m) then write an equation of the line.

11) A(2,20) B(4,32)

m =

b = 8

_____

12) A (-8, 3) B(7,-1)

m =

b = 3

_____

13) A(-5, 3) B(7, 3)

m =

b = 3

_____

14) A(7, 5) B(7, 4)

m =

b = "none"

_____

Try These:

Write the equation of the line given slope (m) and y-intercept (b)

1) When m = 1 and b = -1 _____

2) When m = -1 and b = 5 _____

3) Having slope: 3; and y-intercept: -1 _____

4) Having slope: 4; and y-intercept: 4 _____

Find the slope (m) then write an equation of the line.

5) A(-4,-1) B(-4,8)

m =

b = "none"

_____

6) A(4,-2) B(-2,1)

m =

b = 0

_____

7) A(4,2) B(5,7)

m =

b = 2

_____

Lesson 3: Homework

Write the equation of the line given slope (m) and y-intercept (b)

1) Having slope: 3; and y-intercept: -1 _____

2) Having slope: 4; and y-intercept: 4 _____

3) Having slope: -2; and y-intercept: 6 _____

4) Having slope: -4; and y-intercept: -4 _____

5) When m = 1 and b = -1 _____

6) When m = -1 and b = 5 _____

7) When m = $\frac{2}{3}$ and b = -5 _____

8) When m = 3 and b = 0 _____

9) Having slope: $\frac{3}{5}$ and y-intercept: -5 _____

10) When m = 0 and b = 5 _____

11) Having slope: $\frac{-1}{4}$ and y-intercept: 2 _____

12) When m = $-\frac{5}{7}$ and b = 0 _____

Find the slope (m) then write an equation of the line.

13) A(2, -9) B(6, 3)

m =
b = -15

_____

14) A (-3, 11) B(7,11)

m =
b = 11

_____

15) A(0, 4) B(7, 3)

m =
b = 4

_____

16) A(3, 6) B(3,-6)

m =
b = "none"

_____

Lesson 4

Write an Equation of a Line from a Graph

Vocabulary Review:

1) The standard equation of a line is _____.

2) To write the equation of a line what 2 parts of information do we need? _____ & _____

3) The m represents the _____.

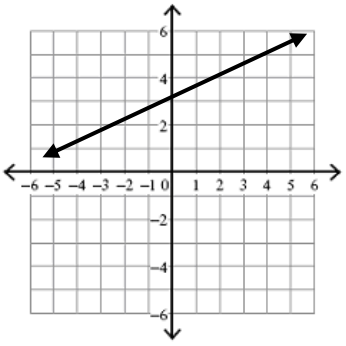
4) The b represents the _____.

5) The _____ is the point where the line crosses the _____.

Rules for Writing the Equation of a line from a graph

1 - Find the y-intercept (b)
2 - Find the slope (m)
3 - Then write the equation of the line.

Examples: Write the equation of the line.

1) 

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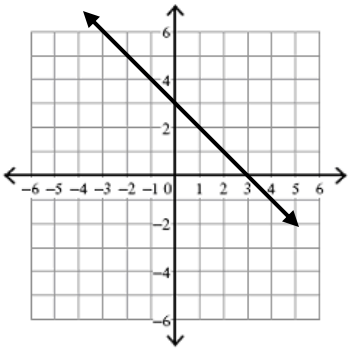
2) 

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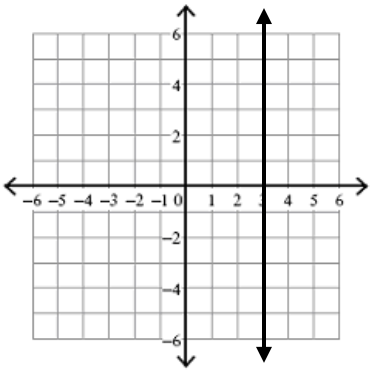
3) 

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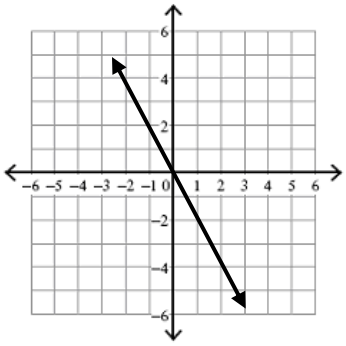
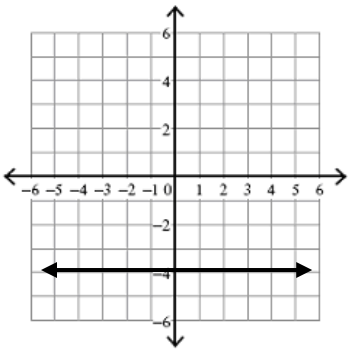
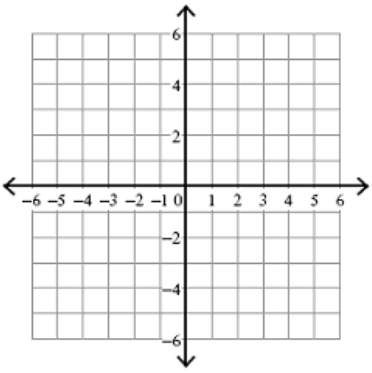
4) 

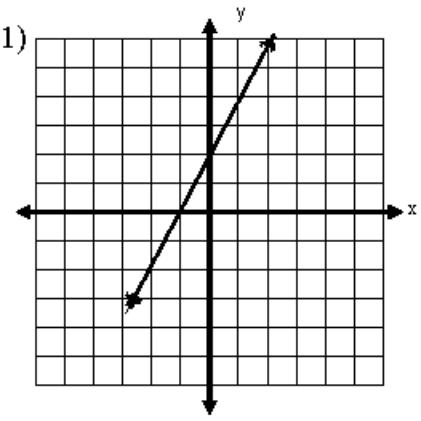
5) 

6) Draw the line through the points
A(1,2) and B (-1,-2)
and then write the equation of the line



Try These: Write the equation of the line

1)

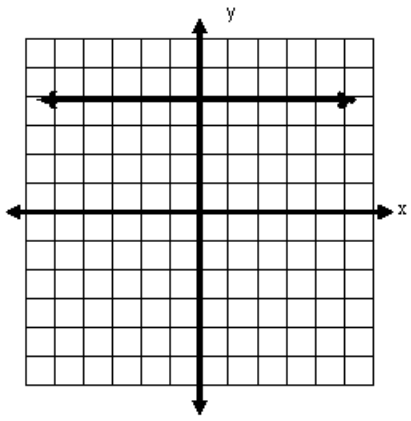


m = _____

b = _____

_____

2)

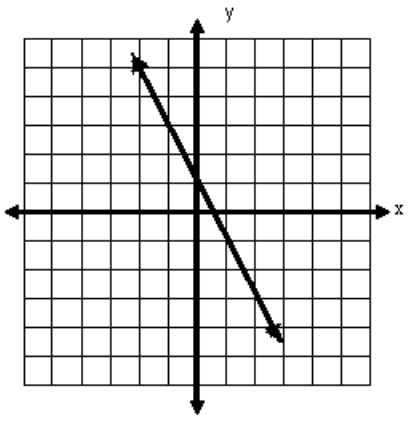


m = _____

b = _____

_____

3)

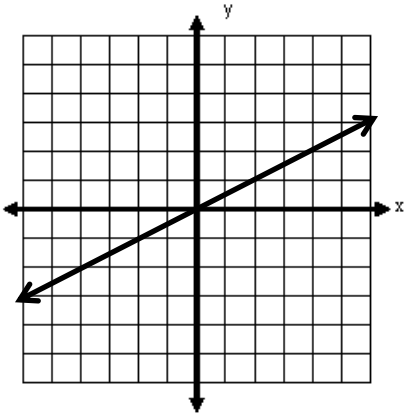


m = _____

b = _____

_____

4)



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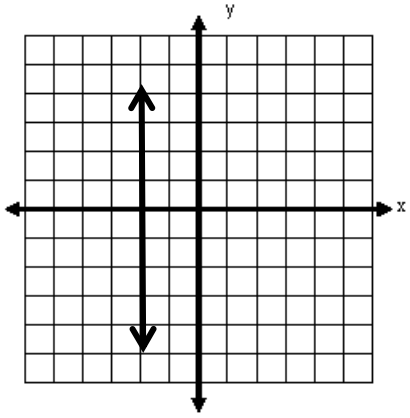
5)



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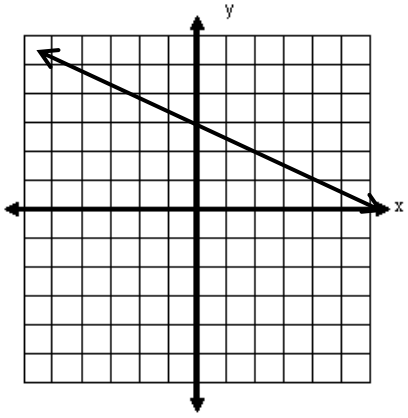
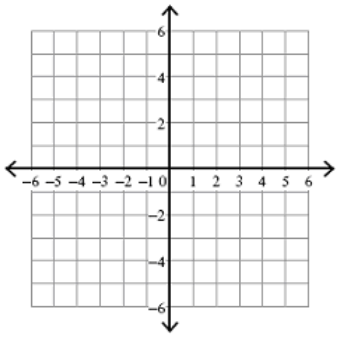
6)

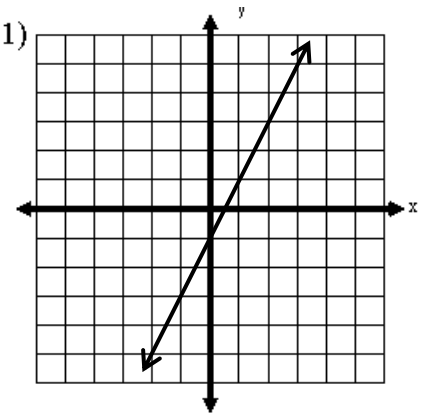


_____

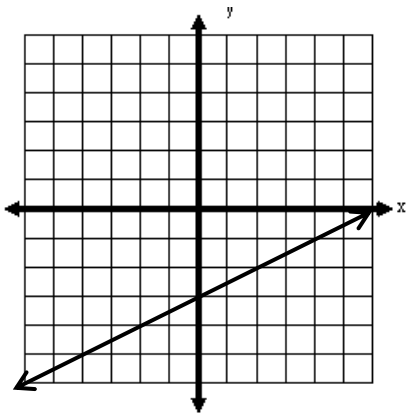
7) Draw the line through the points A(-1,-3) and B (4,-2) and then write the equation of the line



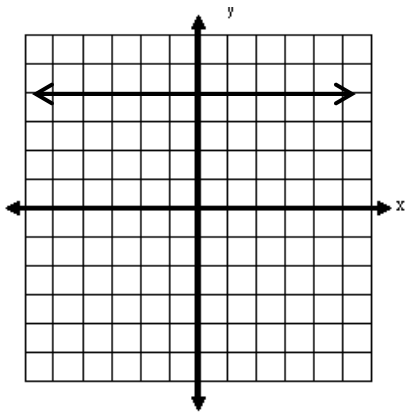
Lesson 4: Classwork Write the equation of the line.

1) 

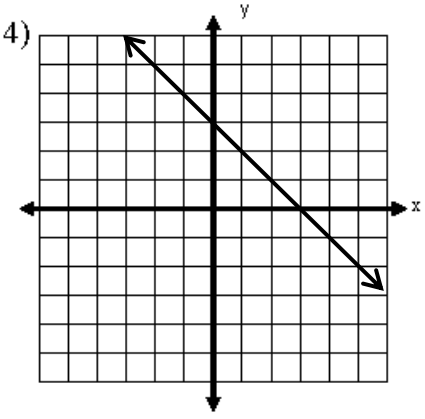
m = _____
b = _____
_____

2) 

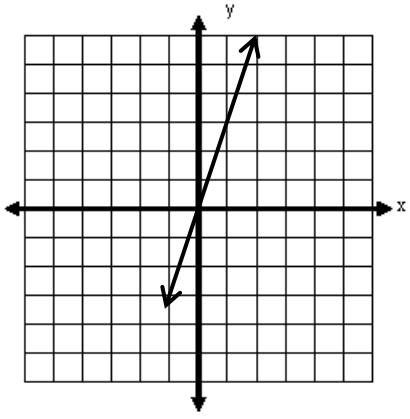
m = _____
b = _____
_____

3) 

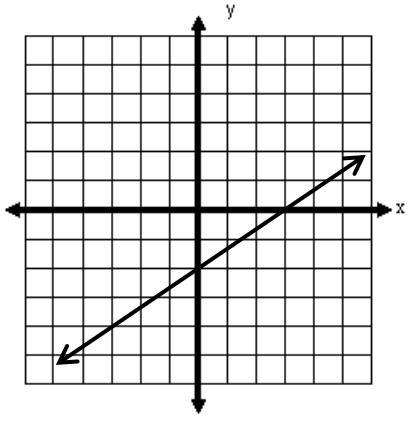
m = _____
b = _____
_____

4) 

m = _____
b = _____
_____

5) 

m = _____
b = _____
_____

6) 

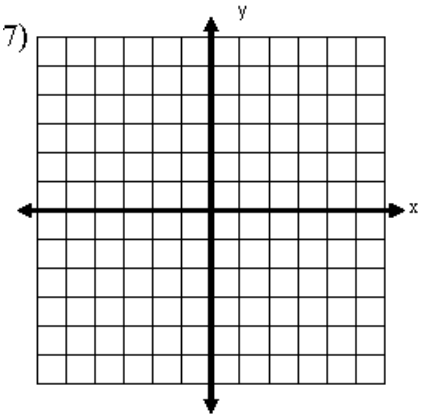
m = _____
b = _____
_____

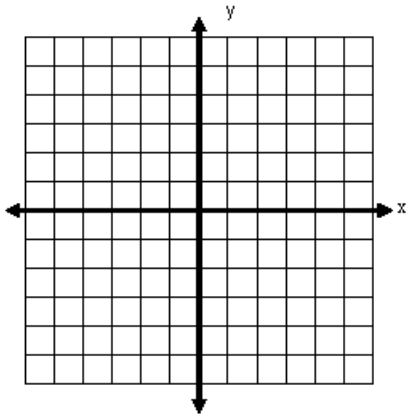
Draw the line through the given points and then write the equation of the line.

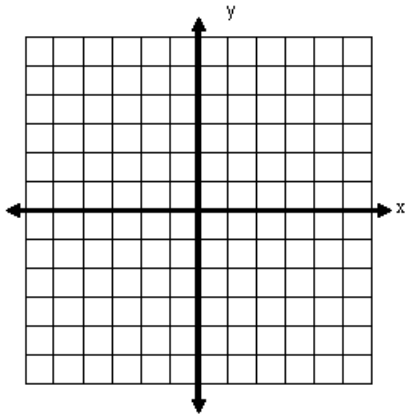
A (-3, 4) B (-3, -5)

A(-2, 1) B (1, -5)

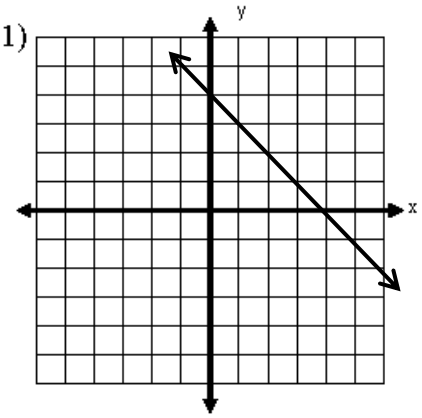
A (-1, 3) B (1, -3)

7) 

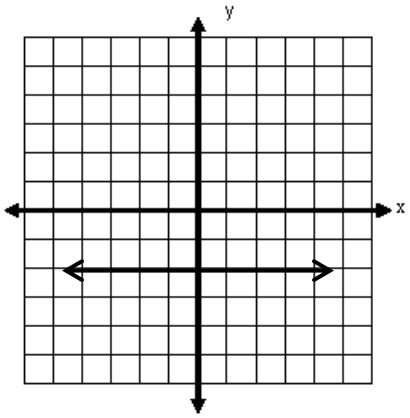
8) 

9) 

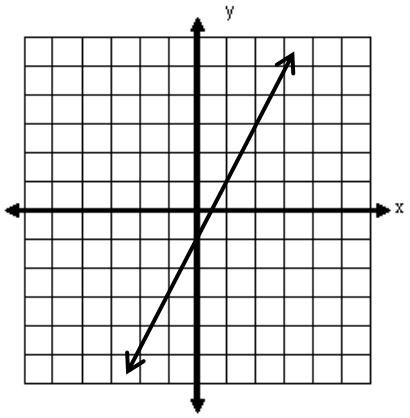
Lesson 4: Homework Write the equation of the line.

1) 

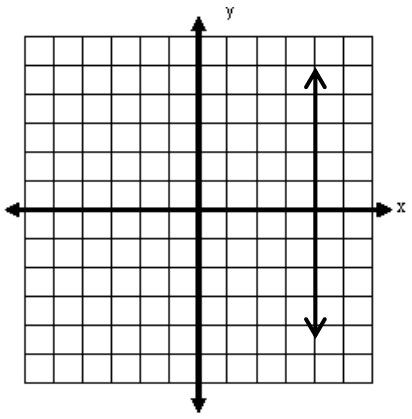
m = _____
b = _____
_____

2) 

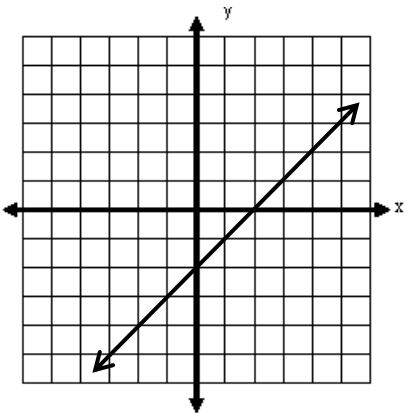
m = _____
b = _____
_____

3) 

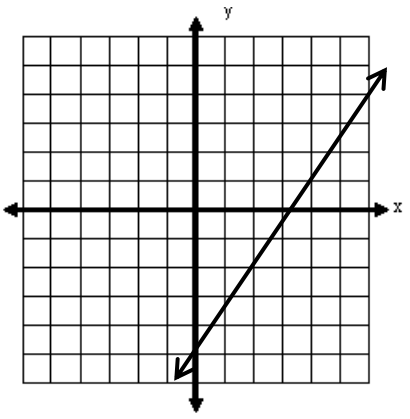
m = _____
b = _____
_____

4) 

m = _____
b = _____
_____

5) 

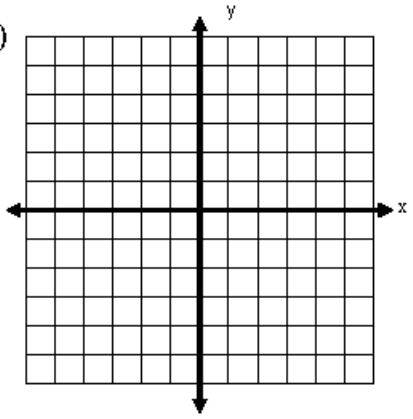
m = _____
b = _____
_____

6) 

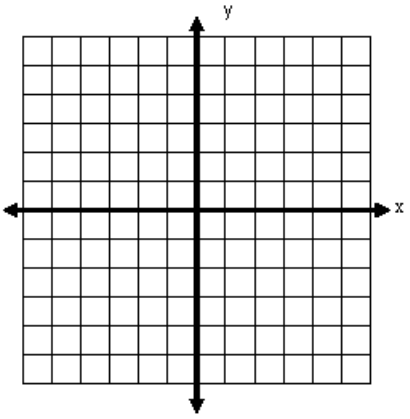
m = _____
b = _____
_____

Draw the line through the given points and then write the equation of the line.

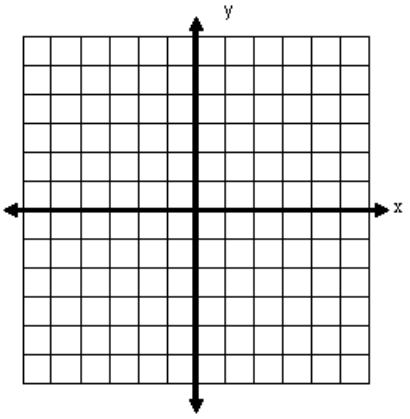
A (3, 3) B (-4, -4)

7) 

A(-3, -3) B (1, 5)

8) 

A (-4, -4) B (2, -1)

9) 

Lesson 5
Functions

Vocabulary:

Function: A set of ordered pairs in which each input value (x) has exactly one output value (y). You can check to see if a graph is a function by using the vertical line test.

Vertical Line Test: If a vertical line is drawn and it intersects the graph once, it is a **function**. If the vertical line intersects the graph more than once, it is **not a function**.

Examples:

Which table represents a function?

1)

x	y
0	-4
1	-1
2	2
3	5
4	8

2)

x	y
0	1
2	1
4	1
6	1
8	1

3)

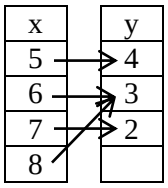
x	y
0	5
1	6
2	7
1	8
0	9

4)

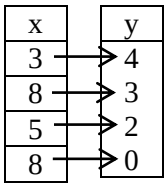
x	y
12	-2
10	-1
8	0
10	1
6	2

Which mapping diagram represents a function?

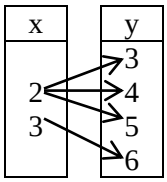
5)



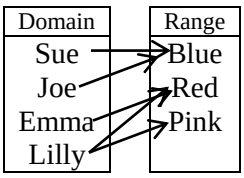
6)



7)

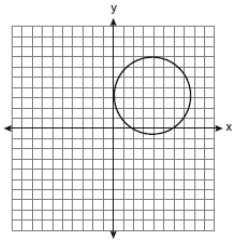


8)



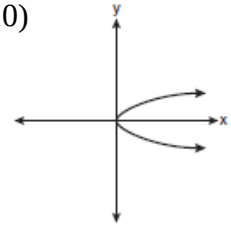
Using the vertical line test state whether or not each graph is a function.

9)



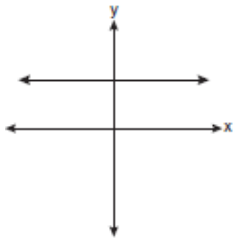
_____

10)



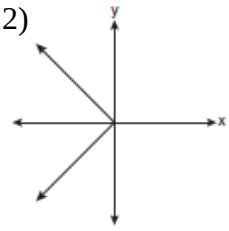
_____

11)



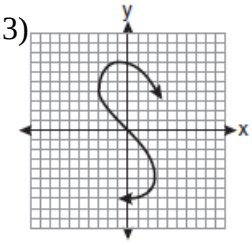
_____

12)



_____

13)



_____

Create a function rule (equation) to represent each situation

14) Emma is writing a term paper. She writes 3 pages per day. If y represents the total pages and x represent days, create a function rule for this scenario.

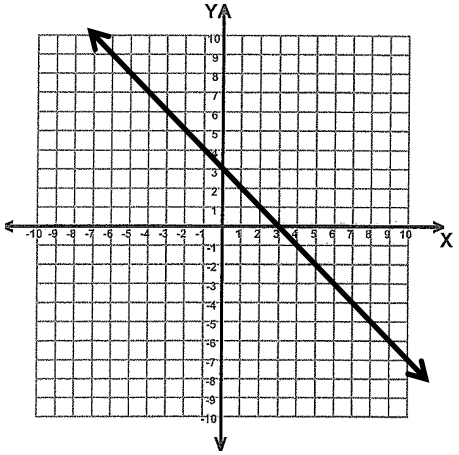
15) A large pool contains 20,000 gallons of water. 5 gallons evaporate each day. y is the gallons of water and x is the days. Write an equation.

16) In a bank account Joe has $45. He earns $2 per day. Write an equation for the situation.

Every function can be written 4 ways:
1 - Equation
2 - Graph
3 - Table
4 - Word Problem

Examples:

1)



A) Write the equation of the line

B) Make a table from the line

x	y

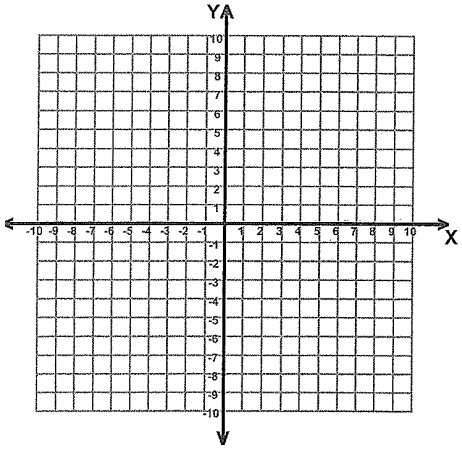
C) Create a situation to represent this graph

2)

x	y
2	-6
4	-2
6	2
8	6

A) Write the equation (function rule) of the line

B) Graph the line



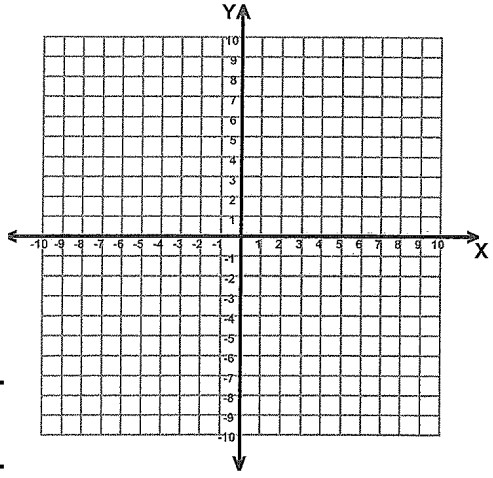
C) Write a situation to model table.

3) $y = -2x + 4$

A) Make a Table

x	y

B) Graph the line



C) Write a situation to model table.

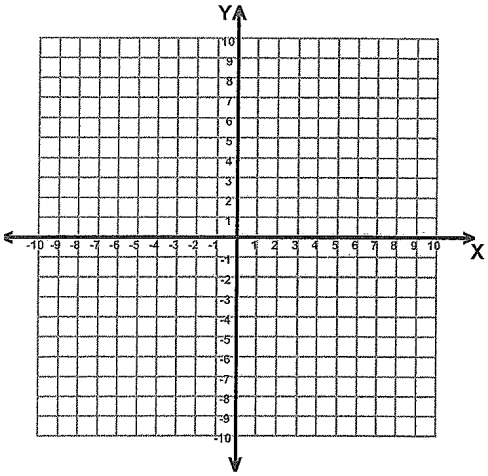
4) Amy has $10 in her piggy bank. She spends $1 per day on ice cream.

A) Write an equation

B) Make a Table

x	y

C) Graph the line



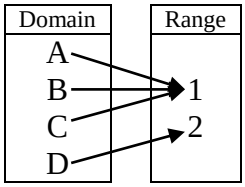
Try These:

Which of the following represents a function?

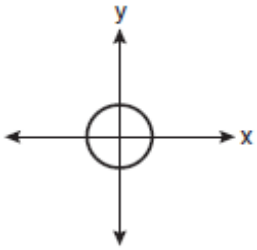
1)

x	y
5	2
7	3
9	4
11	5
5	6

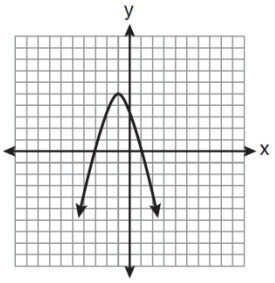
2)



3)



4)



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5) Which set of ordered pairs is *not* a function?

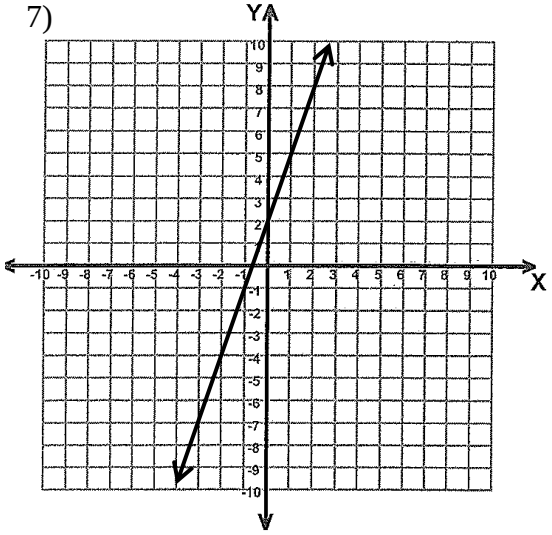
1) $\{(3,1),(2,1),(1,2),(3,2)\}$
2) $\{(4,1),(5,1),(6,1),(7,1)\}$
3) $\{(1,2),(3,4),(4,5),(5,6)\}$
4) $\{(0,0),(1,1),(2,2),(3,3)\}$

6) Which set of ordered pairs represents a function?

1) $\{(0,4),(2,4),(2,5)\}$
2) $\{(6,0),(5,0),(4,0)\}$
3) $\{(4,1),(6,2),(6,3),(5,0)\}$
4) $\{(0,4),(1,4),(0,5),(1,5)\}$

---

7)



A) Write the equation of the line

B) Make a table from the line

x	y

C) Create a situation to represent this graph

_____

_____

Create a function rule (equation) to represent each situation

8) Mr. Murphy has been working out. His bicep started out at 10". If he gains ½" per month, write an equation to match this situation.

9) You sell candy for a school fundraiser. You sell each box for $3. Write an equation for this scenario.

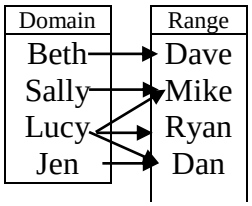
Lesson 5: Classwork/Homework

Which of the following represents a function?

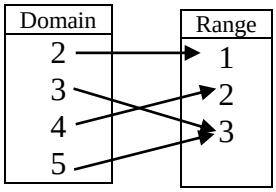
1)

x	y
-2	2
-1	5
0	4
1	5

2)



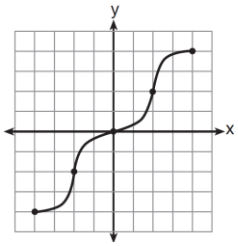
3)



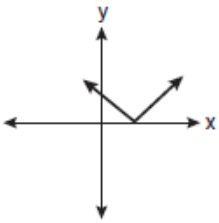
4)

x	y
1	7
5	5
9	3
1	1

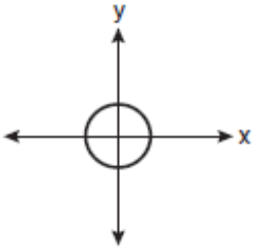
5)



6)



7)



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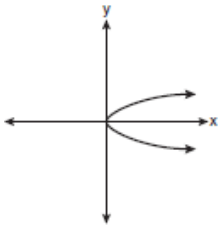
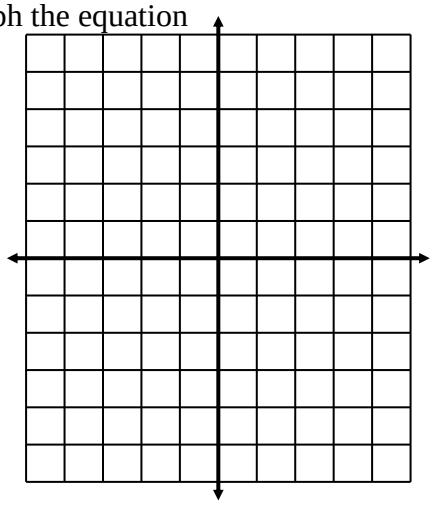


9) $3y = 3x$

A) Make a table from the equation

x	y

B) Graph the equation



C) Create a situation to represent this situation

Create a function rule (equation) to represent each situation

10) You open up a lemon-aide stand. You sell 13 lemon-aides per hour (x). Write an equation for this situation.

Lesson 6
Comparing Rate of Change (Slope)

Vocabulary:

Rate of Change: The measure of how quickly a linear equation increases or decreases. In a line, that is measured by determining the slope. *[**NOTE:** The steeper the slope, the GREATER the rate of change]*

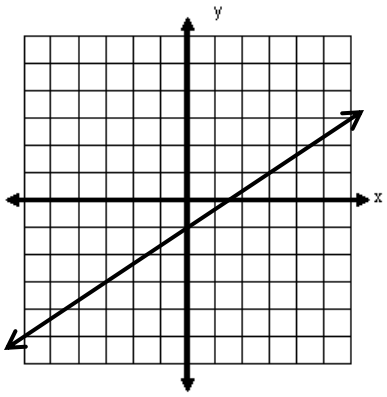
Examples:
Determine the rate of change

1) $y = -2x + 7$ _____

2) $3 - x = y$ _____

3) $5y - 7x = 45$ _____

4) $2y = 8x - 6$ _____

5) 

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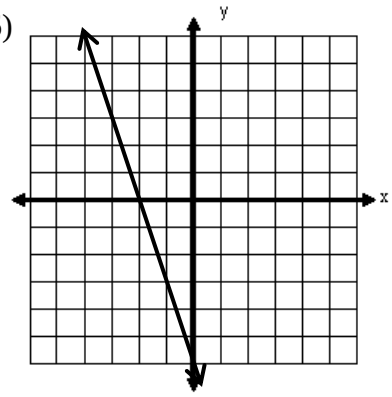
6) 

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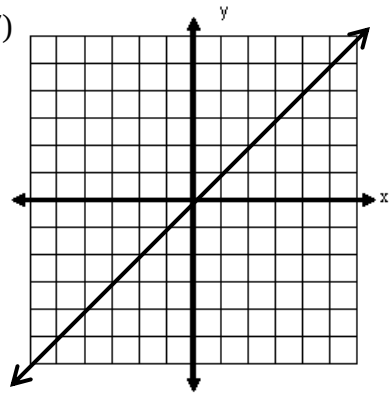
7) 

_____

8)

x	y
5	11
6	9
7	7
8	5
9	3

_____

9)

x	y
0	-1
2	7
4	15
6	23
8	31

_____

10)

x	y
3	5
4	6
5	7
6	8
7	9

_____

11) During a rain storm, it rained 0.5" per hour. What is the rate of change?

_____

12) You buy a car with 3000 miles. Each year you drive an additional 11,500 miles per year. What is the rate of change?

_____

Comparison of Rates of Change

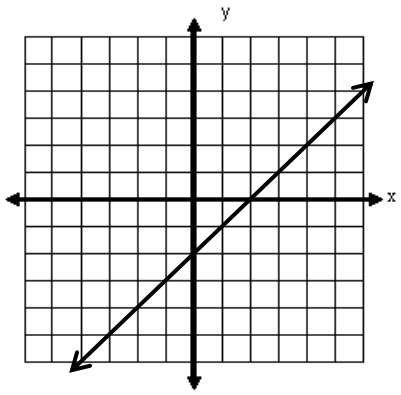
13) The following table and graph represent two different linear functions. Determine which has the greater rate of change.

A)

x	y
-4	-3
-2	-2
0	-1
2	0
4	1

OR

B)



---

14) Which has the greater rate of change?

A) $y = x - 6$ OR B) $2y = 4x + 16$

---

15) Which has the greater rate of change?

A) A balloon deflates at 3 cubic centimeters per hour. At first the balloon is filled up to 30 cubic centimeters.

OR

B)

hour	deflate
0	30
2	25
4	20
6	15

---

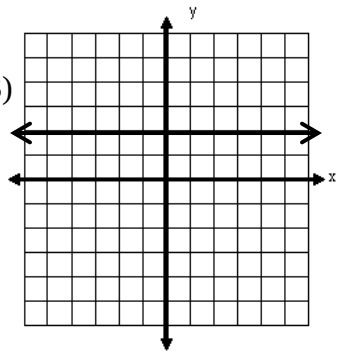
16) In question #15, which example will have more air after 6 hours? _____

Try These:
Determine the rate of change

1) $2y = -2x + 12$ _____

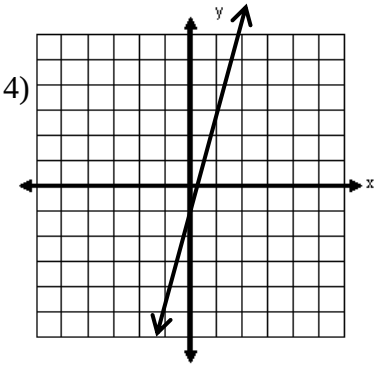
2) $3y - 2x = 1$ _____

3)



_____

4)



_____

5)

x	y
0	11
1	8
2	5
3	2

_____

6)

x	y
2	5
4	8
6	11
8	14

_____

7) The hair on Bill's head grows 1.5" per month. His hair is 6" long. What is the rate of change?

_____

8) The growth of the NY population increases by 95,000 per year. The current population is about 19.5 million. What is the rate of change?

_____

Comparison of Rates of Change

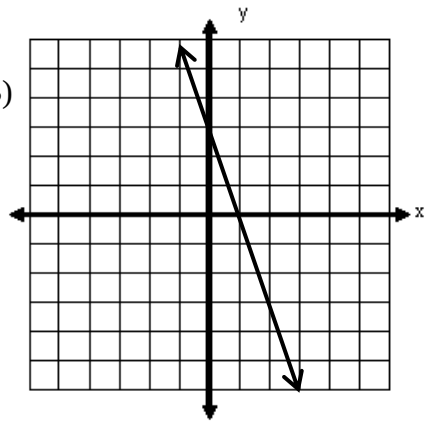
9) The following table and graph represent two different linear functions. Write the equation of each and then determine which has the greater rate of change.

A)

x	y
-2	7
0	11
2	15
4	19

OR

B)



10) In question #9, which y will be the greatest when x = 3? _____

Lesson 6: Classwork/Homework

Determine the rate of change

1) $y = -2x + 1$

_____

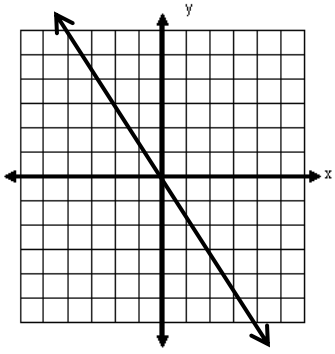
2) $y - 3x = 5$

_____

3) $4x - 9 = 3y$

_____

4)



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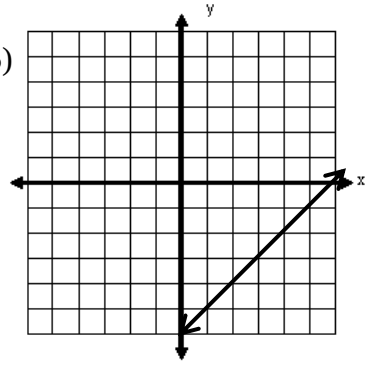
5)



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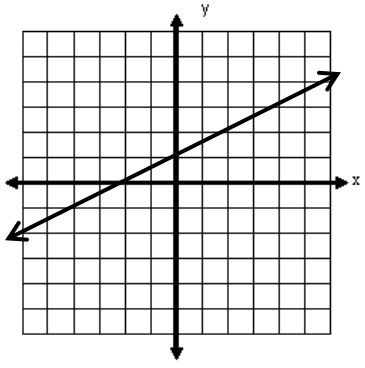
6)



_____

7)

x	y
0	2
1	5
5	17
12	38

_____

8)

x	y
-3	2
-1	4
0	5
9	14

_____

9)

x	y
4	5
6	6
12	9
14	10

_____

10) A jogger can run about 2.5 miles per hour. They run 5 days per week. What is the rate of change?

_____

11) A baby is born and is 20 inches long. If the baby grows on average 5" per year for 17 years, what is the rate of change of growth?

_____

Comparison of Rates of Change

12) Compare the following functions. Write the equation of each function.

A)

Age of Child	Weight of a Child (lb)
0	10
3	34
4	42
6	58

m = _____

B) $2y = 10x + 28$

m = _____

C) When Joe was born he weighed exactly 8 lb. His doctor predicted he would gain 5.5 lbs per year.

m = _____

13) Based on situations in #12, which of the three would have the greatest rate of change? _____

14) From question #12, at age, 10, which example will produce the child with the largest weight?_____

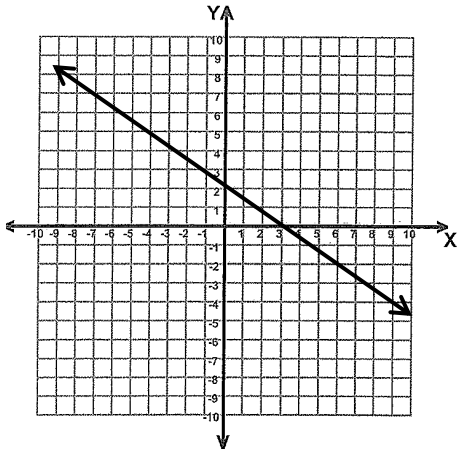
15) Which has the greater rate of change?

A) $y = -x + 8$

B)

x	y
0	5
2	4
6	2
12	-1
14	-2

C)



Review Work:

16) Simplify **$-6(x - 4)$**

17) Simplify: **$3^2 + 4(3) - (-3)$**

18) $\frac{0}{10}$

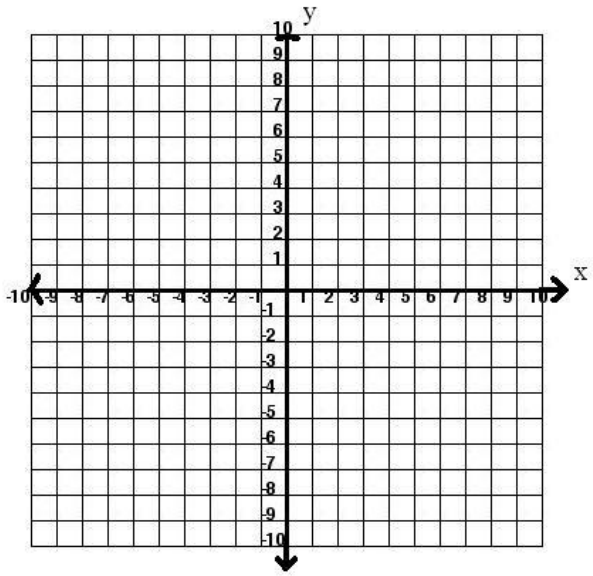
19) $\frac{10}{0}$

20) Evaluate, if x = -2: **$x^2 - 2x$**

Lesson 7
Graphing Systems of Equations
One Solution, No Solution, Infinitely Many Solutions

Review Work:

1) Graph and Solve
y = -x + 2
y = 3x - 2



Solve for x:

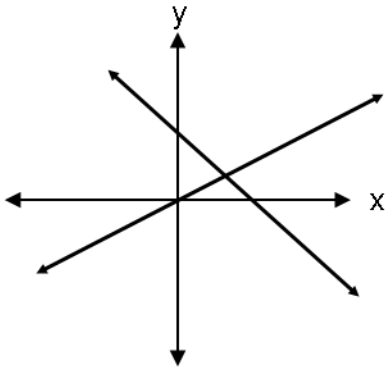
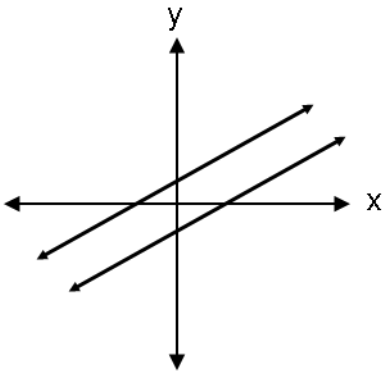
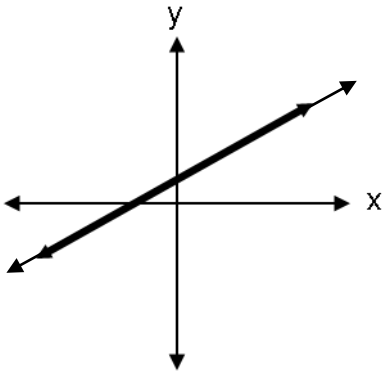
2) $2x - 4 = -x - 1$

3) $2x + 4 = 2(x + 1)$

4) $2x + 4 = 2(x + 2)$

Vocabulary:

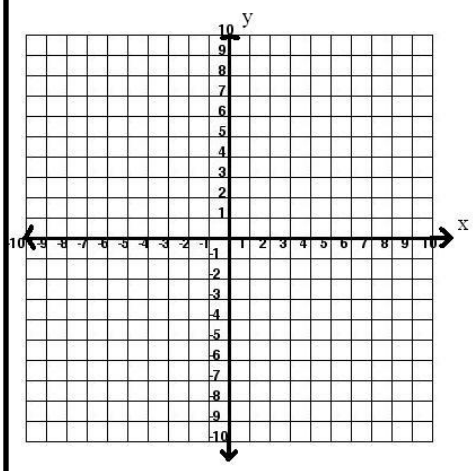
When you graph two lines, there are three things that can happen.

Intersect Once One Solution	Never Intersect No Solution	Same Line Infinite Solutions
		

Examples:

Graph each and determine the type of solution. (one solution, no solution, or infinite solutions).

1) $y = 2x + 4$
$y = 2x - 6$



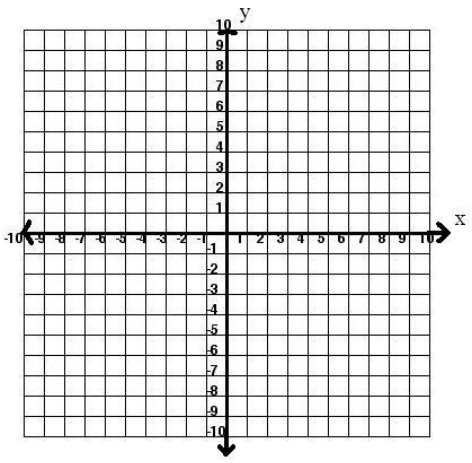
Type of Solution: _____

How does it look graphically?
_____

What do you notice about the slopes and the y- intercepts?

_____

2) $y = x + 6$
$y = -2x$



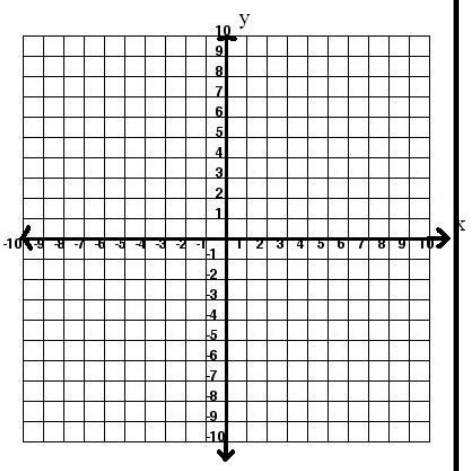
Type of Solution: _____

How does it look graphically?
_____

What do you notice about the slopes and the y- intercepts?

_____

3) $y = 2x + 1$
$2y = 4x + 2$



Type of Solution: _____

How does it look graphically?
_____

What do you notice about the slopes and the y- intercepts?

_____

Finding types of slopes algebraically (By Inspection)

Use your knowledge of slopes and y-intercepts to determine the type of solution.
(one solution, no solution, or infinite solutions).

4) $y = 2x + 8$
$y = 2x – 7$

_____

5) $y = 3x + 8$
$y = -2x – 4$

_____

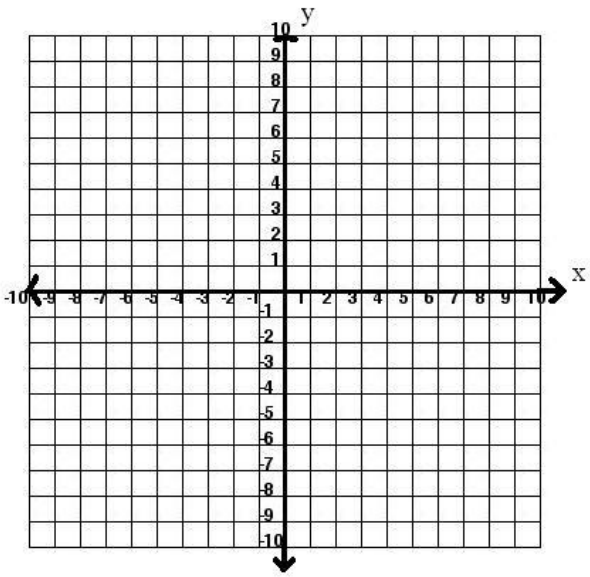
6) $y = 2x + 3$
$3y = 6x + 9$

_____

Try These:
Solve graphically and state the type of solution:

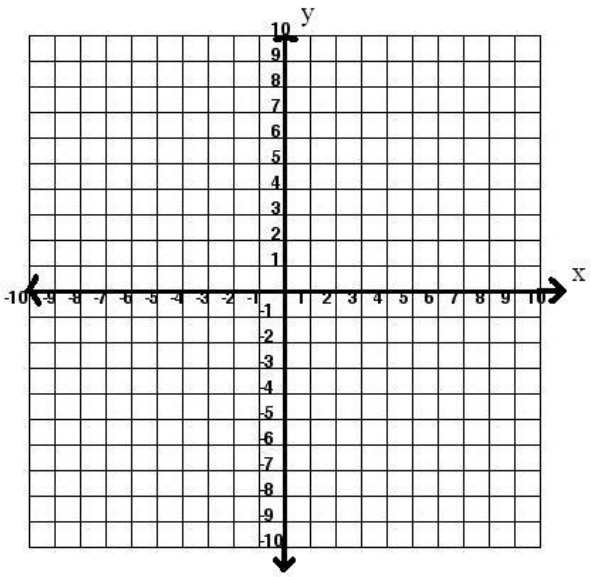
1) $y = \frac{1}{2}x - 3$

$2y = x + 4$



2) $3y - 6x = 12$

$y = 2x + 4$



State the type of slope algebraically and explain how you got the answer.

3) $y = x + 4$
$3y = 3x + 12$

4) $y = 2x + 3$
$y = -2x + 9$

5) $y = 5x + 7$
$y = 5x + 4$

6) $y = 3x + 2$
$y = 3x + 6$

7) $2y = 4x + 16$
$y - 2x = 8$

8) $5x - 2y = 8$
$5x - 2y = -8$

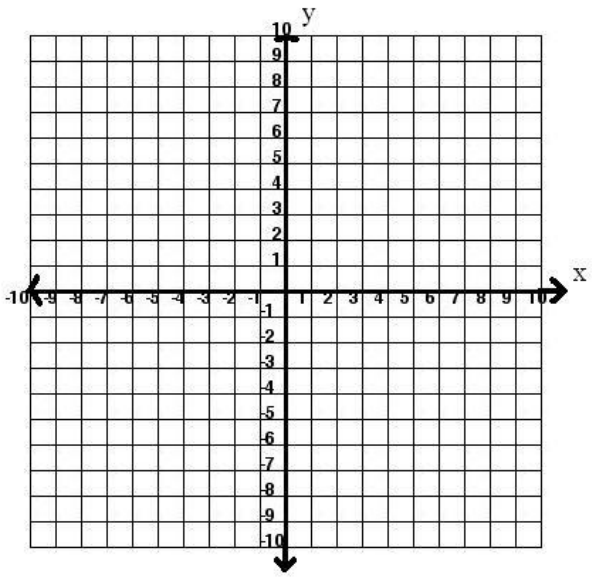
Lesson 7: Classwork/Homework

State the type of solution and then prove it graphically:

1) $y = \frac{4}{3}x + 3$

$y = \frac{-2}{3}x - 3$

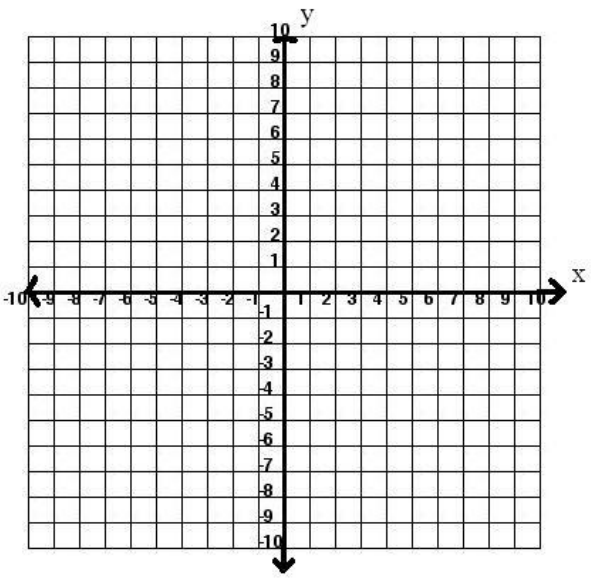
Type of Solution _____



2) $y = 2x + 4$

$2y - 8 = 4x$

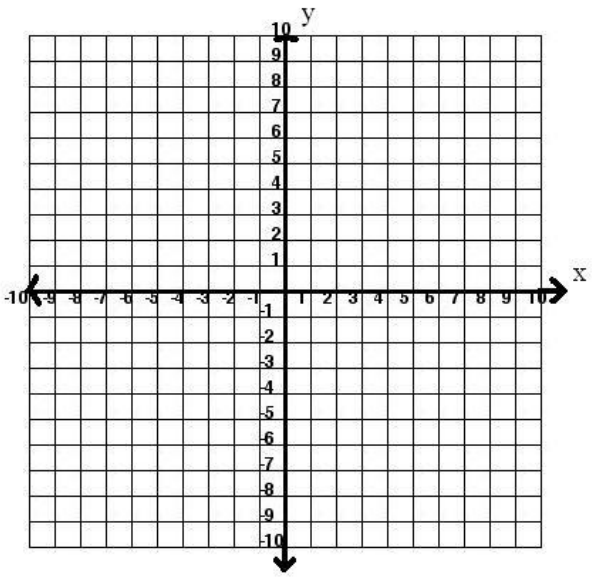
Type of Solution _____



3) $2y = 6x - 10$

$3y - 9x = 12$

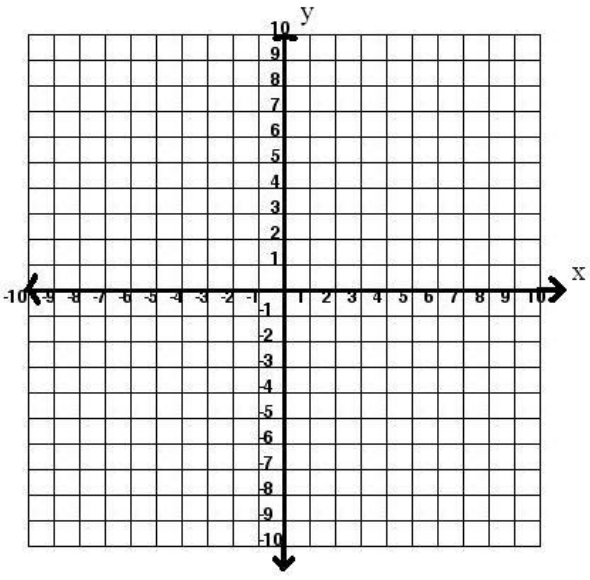
Type of Solution _____



4) $y = 2x - 8$

$y = 2x$

Type of Solution _____



Use your knowledge of slopes and y-intercepts to determine the type of solution.
(one solution, no solution, or infinite solutions).

5) $y = 3x + 8$
$y = 2x + 5$

6) $y = 3x + 8$
$y = 3x + 8$

7) $y = 6x + 3$
$y = 6x + 9$

Review Work:

8) $(8^7)(8)$

9) $(5x^2y)^3$

10) $(8x^2)(-3x)$

---

11) $(5x^2 - 3x - 1) - (2x^2 + 4x - 3)$

12) $\frac{10x^7y}{2x^{10}y}$

---

13) Which ordered pair represents a point that Would lie on the graph of:
$y = 4x - 10$

A) (4, -10) B) (4,6)
C) (-4,6) D) (-4,10)

14) Which is the equation of a line that intersects the y-axis at 3 and has a slope of -3?

A) $y = 3x - 3$ B) $y = -3 + 3$
C) $2y = -3x + 3$ D) $y = -3x + 3$

---

15) Which expression is equal to $(5^4)^{-3}$

A) 5^{-12} B) 5^{-7}
C) 5^{12} D) 5

16) What is the best approximation of $\sqrt{3}$

A) 1.7 B) 1.73
C) 1.74 D) 1.8

Lesson 8
Linear vs Nonlinear

Vocabulary:

Linear Functions - A function in which the graph of the solution forms a straight line. A linear function has a constant rate of change.

Non-linear Functions - The graph of a non-linear function is **not** a straight line. A non-linear function's rate of change in **not** constant.

Remember: Every function can be written 4 ways:

1 - _____

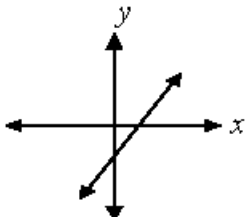
2 - _____

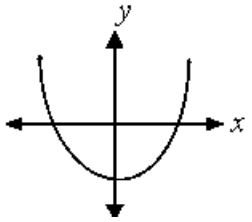
3 - _____

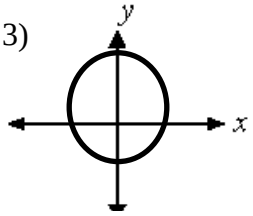
4 - _____

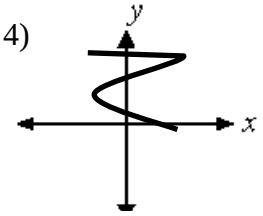
Examples:

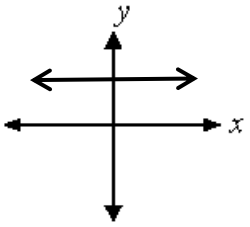
Are the following graphs Linear or Non-linear

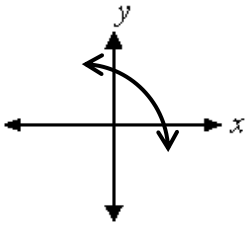
1) 

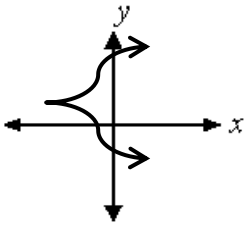
2) 

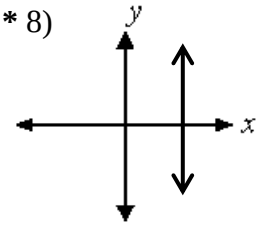
3) 

4) 

5) 

6) 

7) 

***** 8) 

Are the following equations Linear or Non-linear

9) $y = x^3 - 3x + 9$

10) $y = x^2 + 5x - 6$

11) $y = 2x - 10$

12) $y = x^2 + x + 2$

13) $y = 5x$

14) $y = 2$

15) $y = x^2 + 2x$

***** 16) $x = 8$

Are the following tables Linear or Non-linear

17)

x	y
1	10
2	4
3	2
4	4
5	10

18)

x	y
-5	-2
-4	-1
-3	0
-2	1
-1	2

19)

x	y
-1	-1
0	0
1	1
2	2
3	3

20)

x	y
-3	6
-2	1
-1	0
0	1
1	6

Are the following word problems Linear or Non-linear

_____ 21) Sam put $10 in the box under his bed every week

_____ 22) A dolphin jumps above the surface of the ocean water, then dives back in the water.

_____ 23) A soccer player sprints from one side of the field to the other.

_____ 24) A lacrosse player throws a ball upward from her playing stick with an initial height of 7ft and an initial velocity of 90 ft. per second.

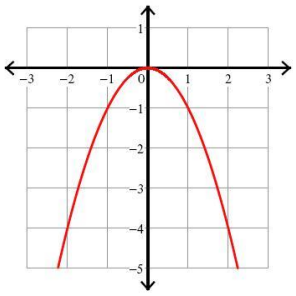
_____ 25) A rocket is shot off into the air and then comes back down to the ground.

_____ 26) Bill borrows $2,500 from the bank and has to pay it off monthly for 30 months

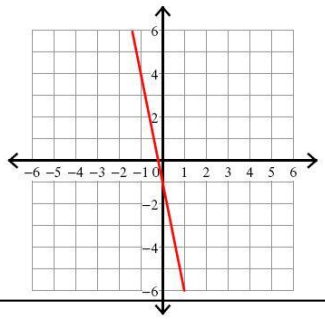
Try These:

Identify if the equation, graph, or table represent a linear equation or a non-linear equation.

1)



2)



3)

x	y
0	3
1	4
2	5
3	6
4	7

4)

x	y
1	10
2	4
3	2
4	4
5	10

5)

x	y
-1	-1
0	0
1	1
2	2
3	3

6) y = 3x + 7

7) $y = x^2 + 5x - 6$

8) Joe jogging 3 miles on Monday, 5 miles on Tuesday, and 2 miles on Wednesday

Lesson 8: Classwork

Are the following equations Linear or Non-linear

____ 1) $y = x^2 - x - 2$
____ 2) $y = |x + 1|$
____ 3) $y = 5x + 2$
____ 4) $y = x^3 - 3x + 9$
____ 5) $y - 7x = -2$

Are the following tables Linear or Non-linear

6)

x	y
2	12
3	14
4	16
5	17
6	18

7)

x	y
1	8
2	4
3	1
4	4
5	8

8)

x	y
-1	-5
0	1
1	0
2	1
3	-5

9)

x	y
-2	6
-1	9
0	12
1	15
2	18

Are the following word problems Linear or Non-linear

10) A baseball player hits a pop fly

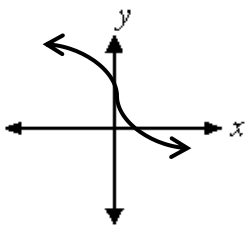
11) The path traveled by a basketball during a shot on the basket

12) A babysitter getting paid $6 per hour

13) You deposit $250 per year for 39 years

Are the following graphs Linear or Non-linear

14)



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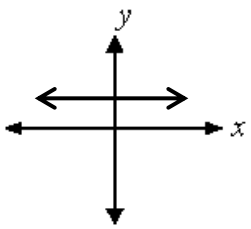

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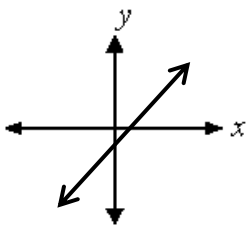

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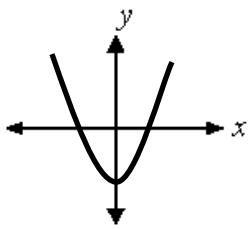


Lesson 8: Homework

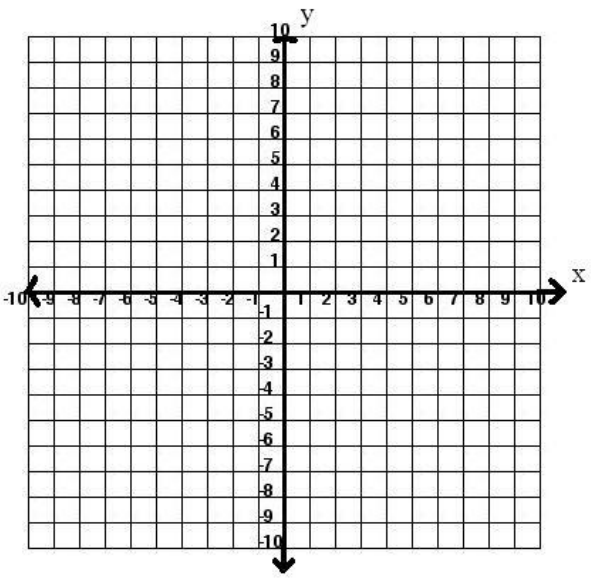
Are the following equations Linear or Non-linear

1) $y = -27x + \frac{2}{15}$ 2) $y = \frac{1}{2}x^2 + 5$ 3) $y = \sqrt{x}$ 4) $y = \frac{3}{x}$

Graph the equation for each function. Then complete the sentence

5)

x	y
-4	-4
-2	0
0	4
2	8
4	12

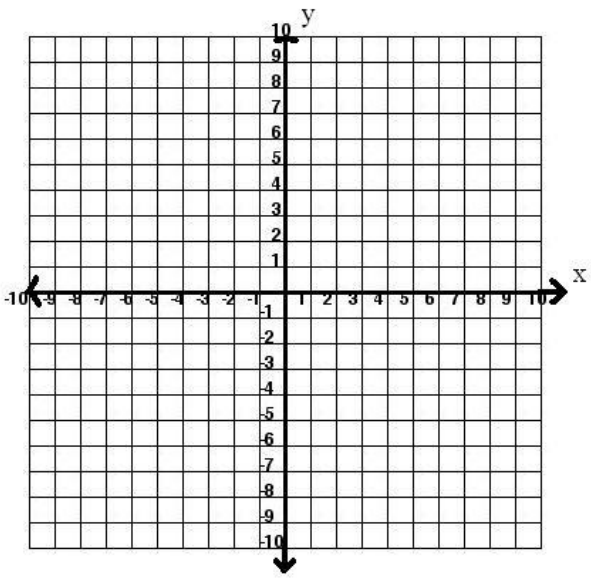


The function is linear/ non-linear because

_____
_____
_____
_____

6)

x	y
1	-7
3	-2
5	0
7	-2
9	-7



The function is linear/ non-linear because

_____
_____
_____
_____

7) Which of the following does not describe a linear function?

A. the perimeter, p, of a square with side s: p = 4s
B. the circumference, C, of a circle with radius r: $C = 2\pi r$
C. the salary, s, of an employee making \$12.50 per hour, h: s = 12.50h
D. the area, A, of a circle with radius r: $A = \pi r^2$

8) Which equation represents a linear function?

A. $y = 8x^4$
B. $y = 0.05x - 0.01$
C. $y = 2x^2 + 5$
D. $\sqrt[3x]{x}$

Name_____ 8R Unit 5 Review

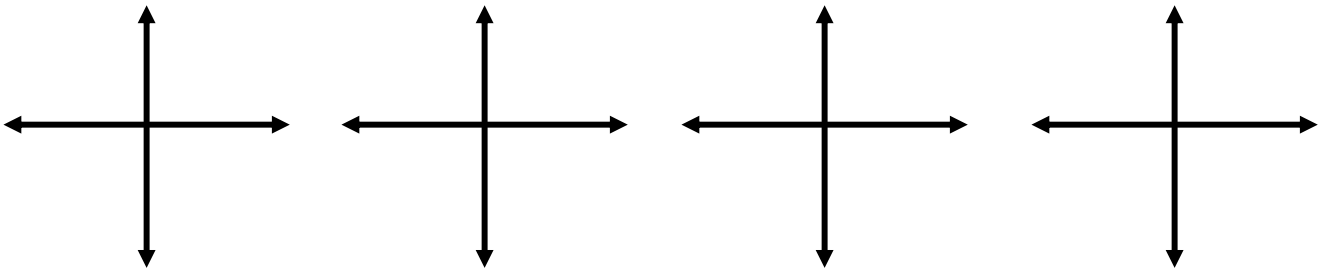
1) y = -6x - 4 2) y = x + 7 3) y = -3x 4) y = x + 10

slope = _____ m = _____ y-intercept = _____ b = _____

y-intercept = _____ b = _____ slope = _____ m = _____

Draw any line with the following slopes:

5) Positive Slope 6) Negative Slope 7) Zero Slope 8) Undefined Slope (no slope)



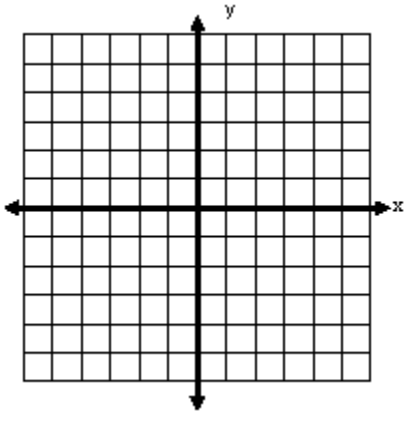
Write the equation of a line when:

9) m = -9, b = 4 10) slope = 1/2, y-intercept = 0 11) m = 1, b = -3 12) slope = 4, y-intercept = 4

Solve for y and write the equation in y = mx + b form:

13) 4x + y = 12 14) -x + y = -6 15) 10 + 5y = 25x

16) Graph the line y = -3x + 5

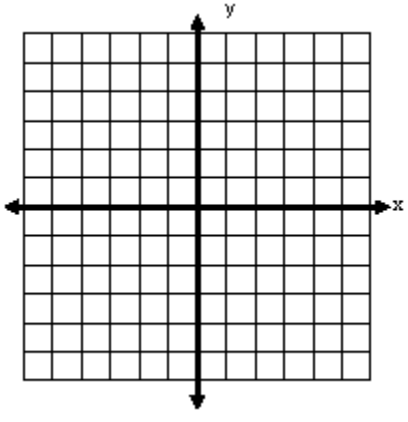


slope = _____

y - intercept = _____

For numbers 17 & 18 graph the line that intersects points:

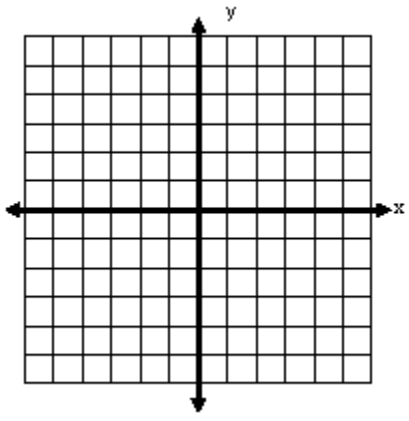
17) (-3,-2) and (2,-2)



What type of slope is graphed?

y-intercept = _____

18) (-4, 3) and (-4, -2)



What type of slope is graphed?

y-intercept = _____

Determine the slope of the line containing the points:

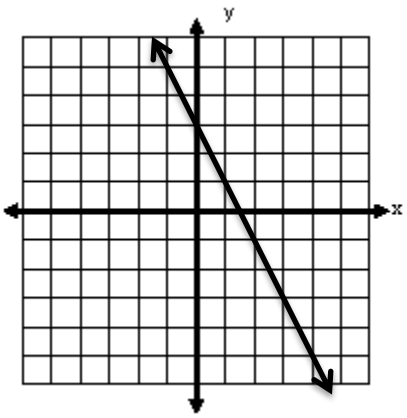
19) (-5, 4) and (-2, 10)

20) (12, 15) and (8, 27)

21) (3, 6) and (-3, 6)

---

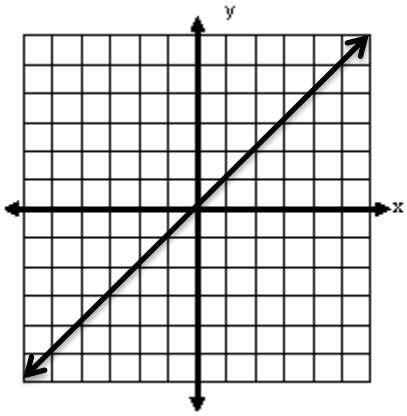
22)



slope = _____
y-intercept = _____
equation of the line = _____
Make a table for the above graph:

x	**y**

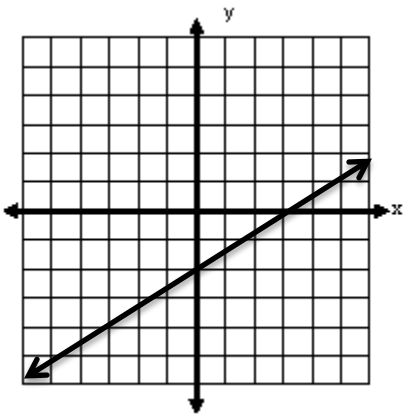
23)



slope = _____
y-intercept = _____
equation of the line = _____
Make a table for the above graph:

x	**y**

24)



slope = _____
y-intercept = _____
equation of the line = _____
Make a table for the above graph:

x	**y**

Write the equation of the line:

25)

x	y
4	10
10	22
16	34
22	46
28	58

rate of change =_____

26)

x	4	5	6	7	8
y	5	7	9	11	13

rate of change =_____

---

27) Place the following rate of changes in order from least to greatest.

a) -3x + 6y = 18

b.) (2, 5) and (5,6)

c.)

x	y
1	7
3	9
5	11

d.) Taxis charge $2 per mile.

28) Determine if the following would be considered a function or NOT a function.

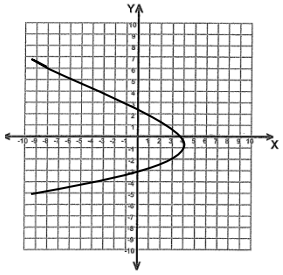
a)

x	y
2	2
4	3
8	4
12	4
15	6

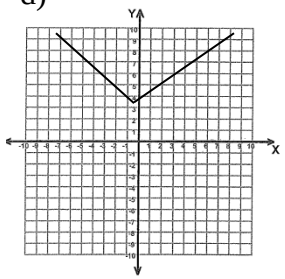
b)

x	y
3	4
8	3
5	2
7	0

c)



d)



e) {(1, 2), (5, 7), (3, 4), (5, 2)}

f) {(1, 3), (5, 3), (7, 4), (8,2)}

---

29) Determine if the following would be considered linear or non-linear.

a) $y = 5x + 1$

b) $-3x + y = 4$

c) $y = x^2 + 3x - 10$

d) $x^2 + y^2 = 25$

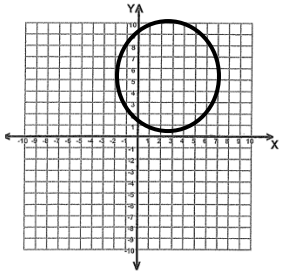
e)

x	2	4	6	8
y	3	5	7	9

f)

x	1	4	8	10
y	0	2	3	2

g)



i) Mike makes $15 a week doing chores around the house.

j) Jane served a volleyball over the net.

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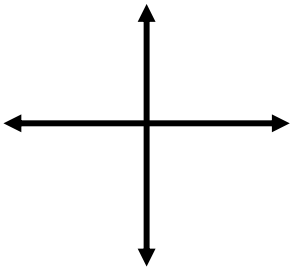
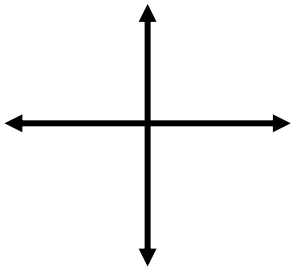
30) Draw 2 lines representing the following number of solutions:

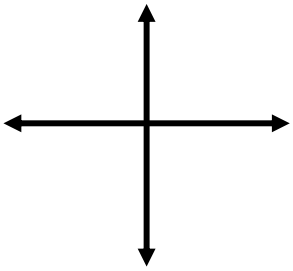
a) No Solutions



b) One Solution



c) Infinite Solutions



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31) How many solutions does each system of equations represent?
(one solution, no solution, or infinite solutions)

a) $y = -5x + 9$
$y = -5x - 6$

b) $y = x + 5$
$3y = 3x + 15$

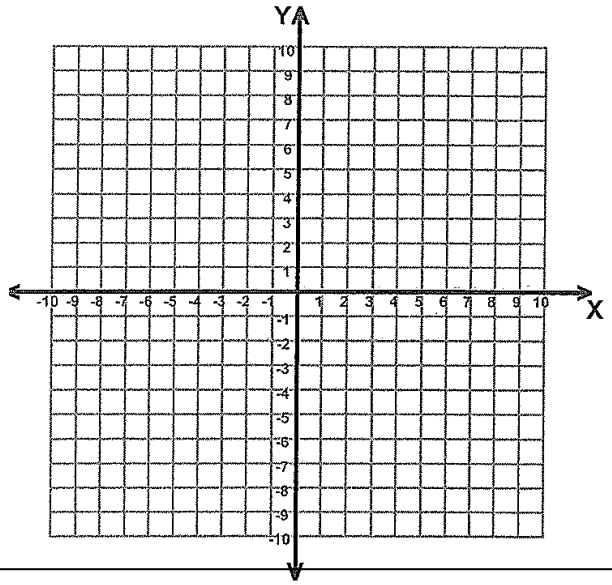
c) $y = 4x + 2$
$y = 3x - 8$

Unit 4 Review:

32) Graph the system of equations:

$y = x + 4$

$y = -2x + 7$



33) What is the solution?_____

34) Check the solution:

Unit 3 Review: Simplify. Rewrite using all positive exponents.

35) $(2x^3)(-5x)$ 36) $(8^4)(8^{-7})$ 37) $\frac{20x^3y^7}{4x^5y^2}$ 38) $(-2x^4y)^3$

Unit 2 Review: Solve for x. State the type of solution (one, no solution, infinite).

39) $4(x - 2) = 3x + 5$ 40) $0.75x + 1 = 0.25(3x + 4)$ 41) $5x - 3 - 2x = 4 + 3x - 1$

Unit 1 Review:

42) Simplify $10 - 2 \times 5 - 2^3$ 43) Convert 59°F into Celsius using the formula $C = \frac{5}{9}(F - 32)$.

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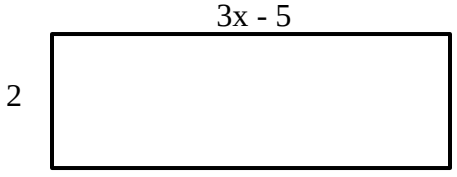
44) a) Find the area. b) Find the perimeter.



Unit 6

Working with Graphs

	Date	Lesson	Topic
		1	Rate of Change
		2	Proportional Relationships
		3	Comparing Graphs
		4	Interpreting Graphs
			Quiz
		5	Construct Scatter Plot
		6	Trend Line (line of Best Fit)
		7	2 Way Relative Frequency Tables
		8	2 Way Relative Frequency Tables
			Review
			Test

Lesson 1
Rate of Change

Vocabulary:

Rate of change – A ratio that compares two quantities. On a linear graph, it is a comparison of the change in y-values of the line to the corresponding change in x-values.

The **formula** for rate of change is _____.

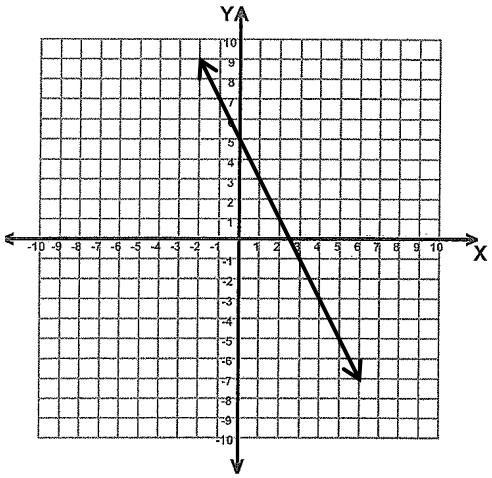
In a linear equation or a graph the rate of change is represented by the _____.

Review:

1) Find the rate of change: (1,1) and (3,7)

2) Find the rate of change: $3y = 2x + 21$

3) Find the rate of change:

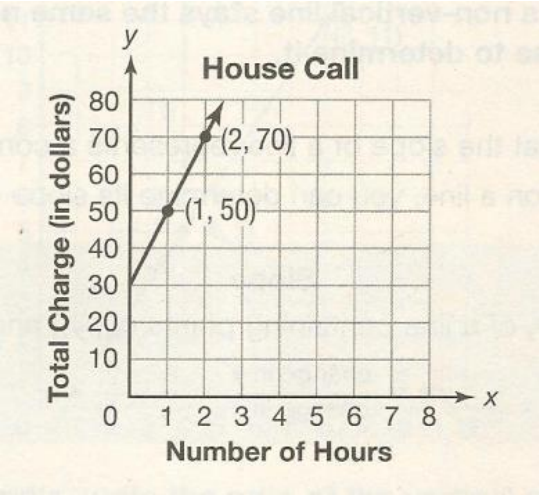


4) Find the rate of change:

x	y
0	10
6	22
8	34
10	46

Examples:

1) A locksmith charges a flat fee for each house call plus an hourly rate, as shown by the graph below.



a) What does the x-axis represent? _____

b) What does the y-axis represent? _____

c) What is the rate of change? _____

d) What does the rate of change represent? _____

e) What is the flat fee that the locksmith initially charges? _____

f) What equation can we use to find how much an 8 hour job is going to cost? _____

2) The table shows how much money Tori has saved. Assume the relationship between the two quantities is linear. Find and interpret the rate of change and the initial value.

Number of Months, x	3	4	5	6
Money Saved, y	110	130	150	170

3) Mr. Murphy graphs his weight throughout the years in 1960 he weighed 120 lbs. (1960, 120) in 1980 he weighed 180 lbs. (1980, 180).

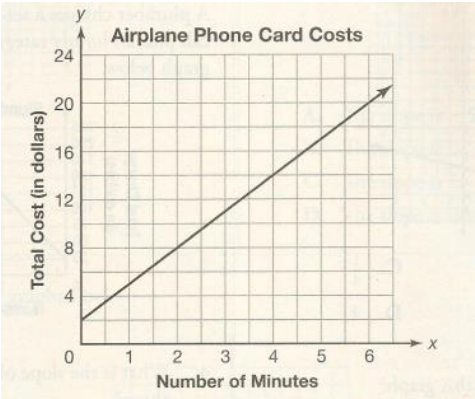
a) What is the rate of change of his weight throughout the years?

b) What is the slope of this data?

c) How much did he weigh in 2010 if his weight continues at this rate?

Try These:

1) Joanie bought an airplane phone card that charges her a connection fee plus an additional rate for each minute the call lasts. The graph below represents this situation.



What is the slope, and what does it represent?

_____

_____

What is the equation of the graph? _____

2) Catherine has some photos in her album. Each week she plans to add 13 photos. Catherine had 120 photos after 8 weeks. Assume the relationship is linear, find and interpret the rate of change and the initial value.

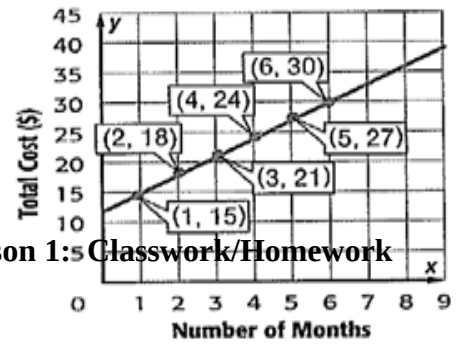
3) A machine salesperson earns a base salary of $40,000 plus a commission of $300 for every machine he sells.

a) Write an equation that shows the total amount of income the salesperson earns, if he sells *x* machines in a year.

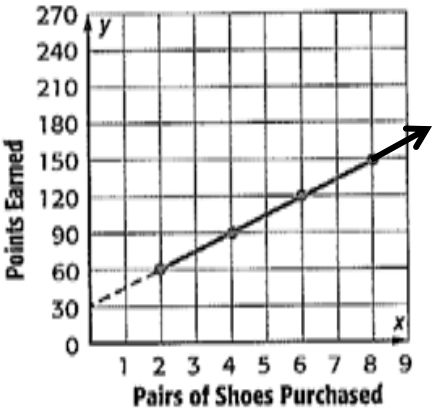
b) What does the slope represent?

c) What would be the salesperson's income if he sold 150 machines?

4) Sirius Radio charges a yearly subscription fee plus a monthly fee. The total cost for different numbers of months, including the yearly fee, is shown in the graph. Find and interpret the rate of change and the initial value.



1) A shoe store offers free points when you sign up for their rewards cards. Then, for each pair of shoes purchased, you earn an additional number of points. The graph shows the total point earned for several pairs of shoes



a) Find and interpret the rate of change and the initial value.

b) Write the equation used to represent the situation.

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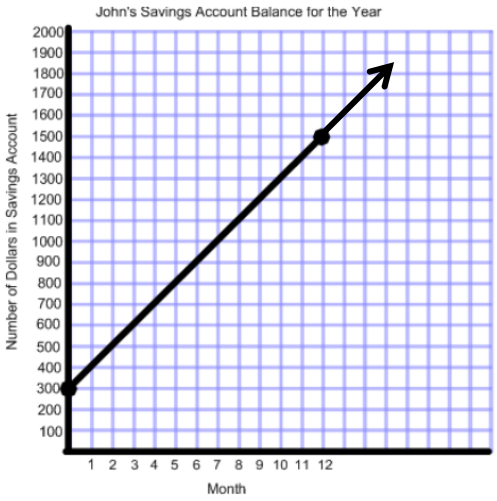
2) The graph shows John's Saving Account balance.



a) What is his monthly RATE of savings?

b) How much money does he start off his account with?

c) At the same savings rate, how much will he have after 20 months?

d) What is the equation of the graph?

---

3)

Mrs. Carrieri rides her bike at a steady rate away from her house. Her distance from the house over time is shown below. How fast is Mrs. Carrieri riding?

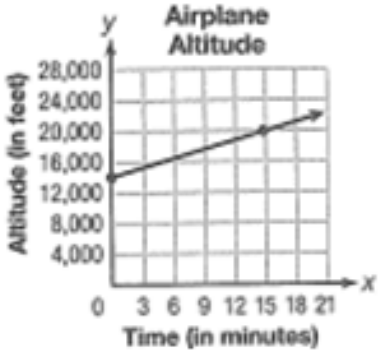
4) Disney World charges a rental fee plus $2 per hour for strollers. The total cost of 5 hours is $13. Assume the relationship is linear. Find and interpret the rate of change and initial value.

---

5) A taxi company charges its customers according to the equation C = 1.2x + 1.5, where C is the cost of the ride in dollars and x is the length of the ride in miles. How does the cost of a ride change with respect to the length of the ride?

---

6) An airplane ascends from an altitude of 14,000 to an altitude of 20,000 feet in 15 minutes. Its altitude over time is shown in the graph below. Calculate and interpret the rate of change of the plane's altitude with respect to time.



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7) The population of Bay Village is 35,000 today. Every year the population of Bay Village increases by 750 people.

a) Write a linear model that represents the population of Bay Village *x* years from today.

b) In approximately how many years will the population of Bay Village exceed 50,000 people?

Review Work:

8) Simplify the expression $5^5 \times 5^{-7}$

A) 5^{12} B) 5^2 C) $\frac{1}{5^2}$ D) $\frac{1}{5^{12}}$

9) Which expression is equal to $\frac{13^{-11}}{13^{-12}}$?

A) 13^{-23} B) 13^{-1} C) 13 D) 13^{132}

10) Which expression is equivalent to 1 ?

A) 1^{-5} B) 6^0 C) 10^1 D) $10x^0$

11) What is the solution to $12 - 12n = -24$?

A) n = 5 B) b = 3 C) n = -3 D) n = -5

12) Which ordered pair represents a point that would lie on the graph of $y = 4x - 10$?

A) (4, -10) B) (4, 6) C) (-4, 6) D) (-4, 10)

13) What is the slope of the line $y = \frac{3}{4}x - \frac{1}{2}$?

A) $\frac{3}{4}$ B) $\frac{1}{2}$ C) $-\frac{3}{4}$ D) $-\frac{1}{2}$

14) Write in standard linear form: $6x + 2y = 22$

Lesson 2
Proportional Relationships

Vocabulary:

Proportion - An equation stating that two ratios are equal in value.

Direct Proportion - The ratio of two variables, such as *y* and *x*, is a constant, *m*. That means that for every change in *x*, *y* changes by a constant factor, *m*. We can say that *y* is directly proportional to *x*.

A **Proportional Relationship** (Direct Proportion) can be represented in different ways.

Examples:

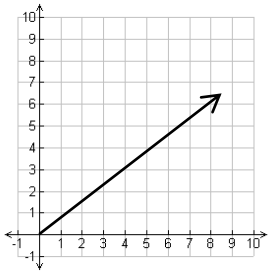
1) Which equations represent direct proportions?

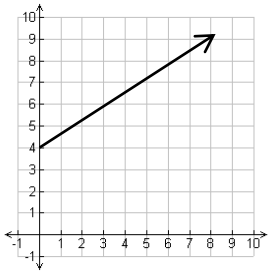
A) $y = 3x + 6$ B) $y = \frac{1}{2}x - 3$ C) $y = 7x$ D) $y = -2x - 4$ E) $y = \frac{2}{3}x$

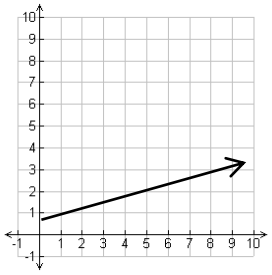
Rule: To determine if an equation has direct proportion

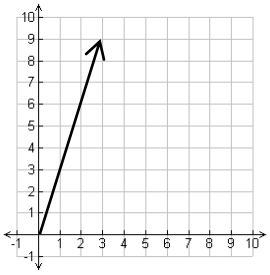
_____

2) Which graph represents direct proportions?

A) 

B) 

C) 

D) 

Rule: To determine if a graph has direct proportion

_____

3) Which tables represent direct proportions?

A)

x	y
1	1
2	2
3	3

B)

x	y
0	5
5	10
10	15

C)

x	y
0	0
8	16
16	32

D)

x	y
1	3
2	6
5	15

Rule: To determine if a table has direct proportion

_____

4) What is the direct proportion for each equation?

A) $y = 4x$ B) $y = \frac{3}{5}x$ C) $y = x$ *D) $y = 2x + 8$

Rule: The direct proportion of equation is the same as

_____

Solving word problems:

5) A taxi charges $1.35 per mile traveled. If the total charge for one ride was $10.80, how many miles were traveled? (Does this have direct proportion?)

Steps:
1 - Define x
2 - Write an equation
3 - Solve the equation
4 – Answer the question

6) Another taxi charges $ .99 per mile traveled but has a flat fee of $2.50. If the total charge for one ride was $10.42, how many miles were traveled? (Does this have direct proportion?)

7) Brent's cab company charges $4.00 per mile for a ride.
Carl's cab company charges $7.00 plus an additional $2.00 per mile for a ride.

A) Write a linear equations for each that shows the cost in dollars, ***y***, for a cab ride of ***x*** miles for each cab driver.

Brent's: _____ Carl's: _____

B) Which cab company has direct proportion?

C) Which cab company would you ise if you had to travel 10 miles? Explain why.

8) The debate team won 3 out of 5 debates it participated in this semester. If the team participated in 20 debates, how many debates did they win? How many did they lose?

Try These:

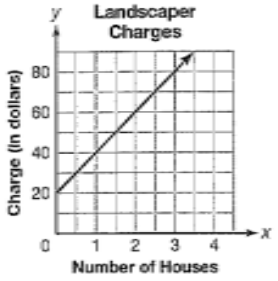
1) The table shows the distance, *y*, in meter, that Ariel can run during the time, *x*, in minutes. Does the table show a direct proportion?

Ariel's Running Record

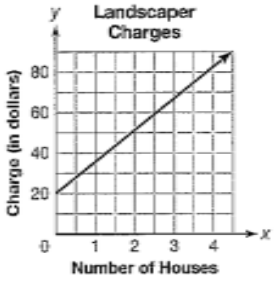
x	1	2	3	4
y	350	700	1050	1400

2) Each graph shows the rate charges by four different landscapers for a landscaping job. Which graph shows a direct proportion?

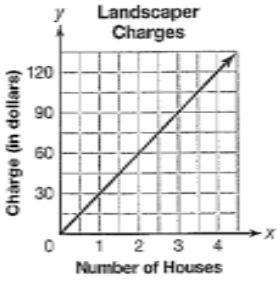
A.



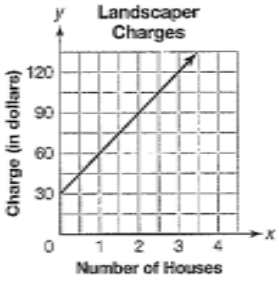
B.



C.



D.



3) The following table represents the conversion for quarts to liters.

Quarts (***q***)	Liters (***l***)
1	0.95
2	1.9
3	2.85
4	3.8
5	4.75

a) What is the rate of change?

b) Write an equation to find the number of liters in any number of quarts.

c) How many liters are in 8 quarts?

d) Does this represent a direct proportion? Justify your answer.

4) A killer whale eats an average of 2 tons of plankton every day. The relationship between the number of days and the number of tons of plankton eaten can be expressed in a table.

Number of Days *x*	Amount of Food Eaten (in tons) *y*

How would you express it in equation form? _____

5) Which table represents a direct proportion?

A.

x	1	2	3	4
y	2	5	10	17

B.

x	1	2	3	4
y	2	3	4	5

C.

x	1	2	3	4
y	0	1	2	2

D.

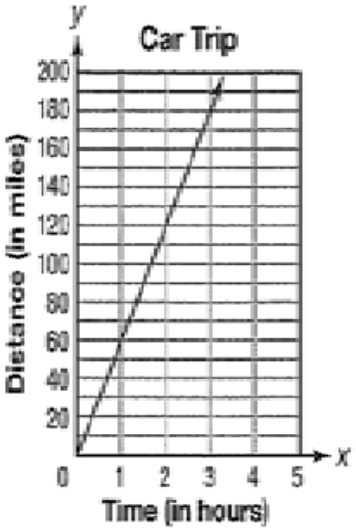
x	1	2	3	4
y	4	8	12	16

---

6) Jimmy makes $8.50 per hour. Write a proportional relationship that shows how much Jimmy makes, y, based on the number of hours he works, x.

---

7)



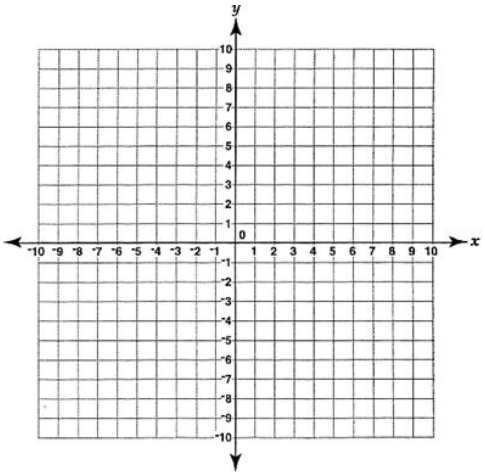
a) What does the slope represent?

b) Write the equation to represent the situation.

c) Does the graph represent a direction proportion?

---

8) Draw a line on the graph below that shows direct proportion



9) Make a table that has direct proportion

x	y

10) Write an equation that has direct proportion.

Lesson 2: Classwork/Homework

1) Circle the equations that represent a direct proportion and justify your answer.

a) $y = 3x + 4$ b) $y = x$ c) $y = \frac{1}{2}x$ d) $y = x^2$ e) $y = -2x - 8$ f) $y = \frac{1}{3}x$

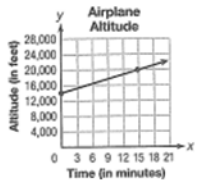
_____

_____

_____

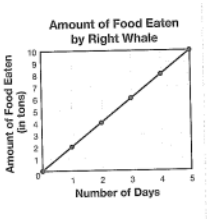
2) Circle which of the following graphs represent a proportional relationship?

A

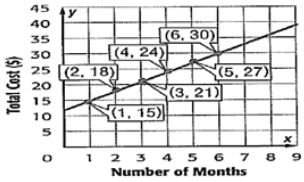


B

C



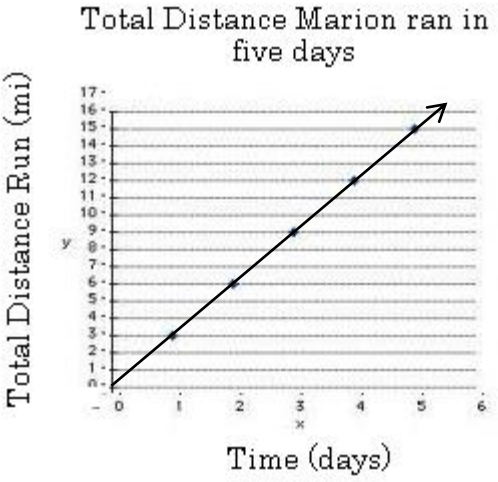
D



3) Write an equation whose direct proportions is $\frac{2}{5}$. _____

4) a) What is the rate of change of the graph below? _____

b) Write an equation to find the number of miles run *y* after any number of days *x*. _____



c) How many miles will Marion run in the month of September? _____

5. Which is the equation of a line that intersects the y-axis at 2 and has a slope of -2?

A) $y = 2x - 2$ B) $y = -2 + 2$ C) $2y = -2x + 2$ D) $y = -2x + 2$

6) What is the value of $(2^3)^{-2}$?

A) 0 B) $\frac{1}{16}$ C) $\frac{1}{8}$ D) $\frac{1}{64}$

7) The table shows the total number of text messages that Brad sent over 4 days.

Number of Days, *d*	1	2	3	4
Total Messages, *m*	50	100	150	200

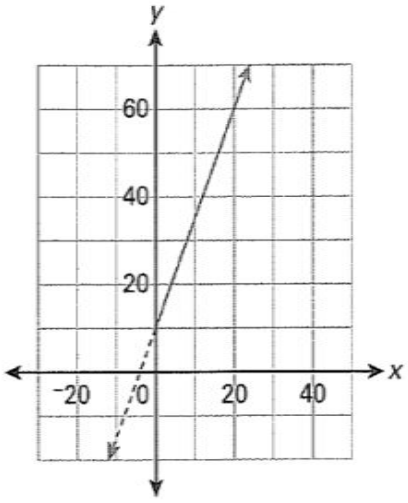
a) Write an equation to find the total number of messages sent in any number of days. Describe the relationship in words.

b) Use the equation to find how many text messages Brad s would send in 30 days.

8) a) What are the advantages to represent a function as an equation instead of a graph?

b) What are the disadvantages to represent a function as an equation instead of a graph?

9) The Grade 8 class is planning a party. The graph shows refreshments costs,y, based on the number of students who will attend the party, x. What is the equation of the graph in slope-intercept form?



A) y = 0.4x + 10

B) y = 2.5x + 10

C) y = 3x + 10

D) y = 10x + 2.5

10) Your parents decided to give you a gift of $650 each year on your birthday, starting when you turn 1.

a) If this trend continues, how much money would your parents have given you on the day before your 32nd birthday?

b) What is the rate of change?

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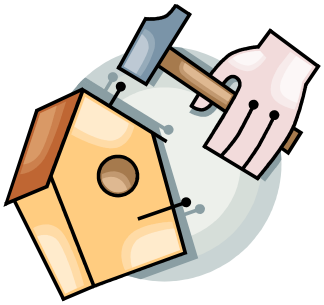
11) Sal makes bird houses for fun. It takes him 5 days to build 2 houses.



a) At this rate, what portion of a house does he build each day?

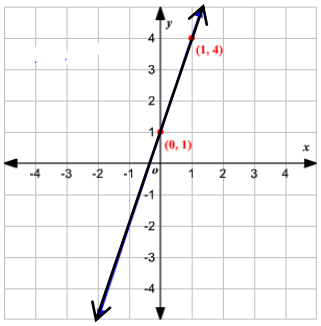
b) Write the equation that represents the situation?

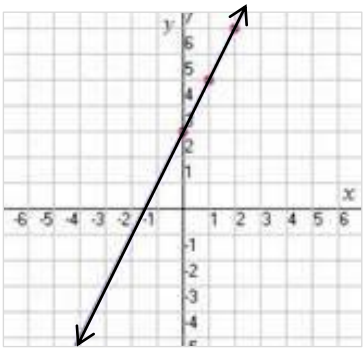
c) After 1 year, if he continues at this rate, how many houses did he build?

Lesson 3
Comparing Graphs

Review Work

1) Which graph has a greater rate of change?





2) Which equation has a greater rate of change?

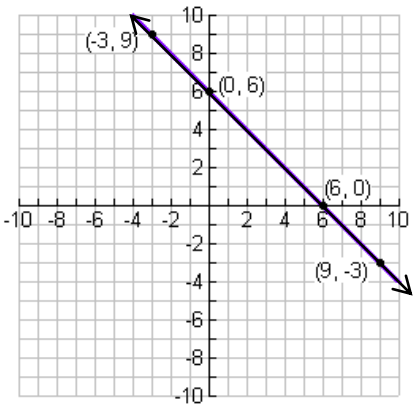
A) $y = \frac{2}{5}x + 5$ B) $y = 2x + 5$

3) Which table has a greater rate of change?

x	y
2	10
4	20
6	30
8	40

x	y
1	6
2	12
3	18
4	24

4) Make a valid statement comparing the equation y = -2x + 6 and the graph below. Use facts to support your statement.



Comparing Graphs

Rule:

When comparing any two graphs

1) Put them both in standard equation form
2) Find the slope (rate of change)
3) Answer the question

$$y = mx + b$$

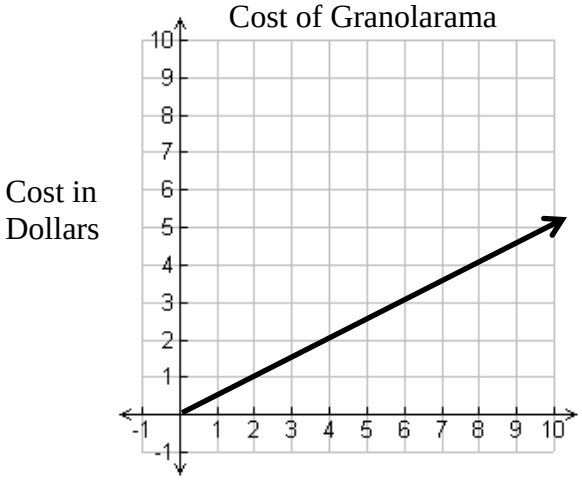
Examples:

1) A grocery store sells two varieties of trail mix: Wholesome Granola and Granolarama. Use the graph and the table to determine **which granola is a better buy.**

Cost of Wholesale Granola

Ounces of Granola	Cost of Granola
5	$2
10	$4
15	$6
20	$8

Cost of Granolarama



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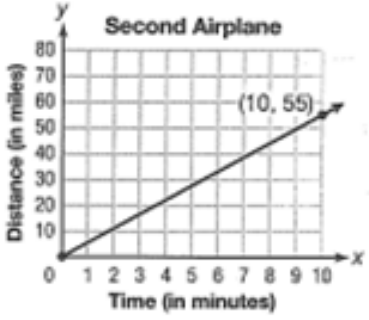
2) Two airplanes leave an airport and travel at a steady speeds. The first plane's distance from the airport in miles, d, over time in minutes, t, is given by the equation below. (Remember d = rt)

First airplane: d = 4.9t

The second plane's distance from the airport over time is given by the graph.



Find the speed of each airplane with the proper units.

First Airplane: _____

Second Airplane: _____

Which plane travels at the faster rate, and by how much? _____

Try These:

1) Tom and Eric are both house painter, and each charges an hourly rate of a painting job. The equation y = 13x shows the total charge, y, in dollars, for hiring Tom to paint a house for x hours. The table below shows the same information for Eric.

Eric's Charges

x	2	4	6	8
y	26	52	78	104

Which statement is true?

A) Tom's hourly rate is $1.00 cheaper.
B) Eric's hourly rate is $1.00 cheaper.
C) Eric's hourly rate is $13.00 cheaper.
D) Tom and Eric work for the same hourly rate.

---

2) The number of new movies a store receives can be represented by the function $m = 7w + 2$, where m represents the number of movies and w represents the number of weeks. The number of games the same store receives is shown in the table.

Week	Number of New Games
1	3
2	6
3	9

a) Compare the functions' y-intercepts and rates of change.

_____

_____

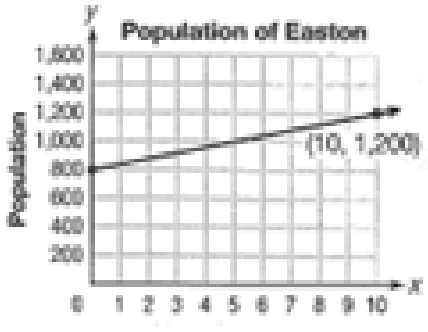
b) How many new movies and games will the store have in 6 weeks?_____

---

3) The population of two small towns change at a steady rate over a 10-year period. The population of Holbrook is given by the equation below, where P is the population, and t is the number of years since the year 2000.

Population of Holbrook: $P = -40t + 920$

The population of Easton is shown in the graph. ⟶



Find the rate of change in each town's population with the proper units

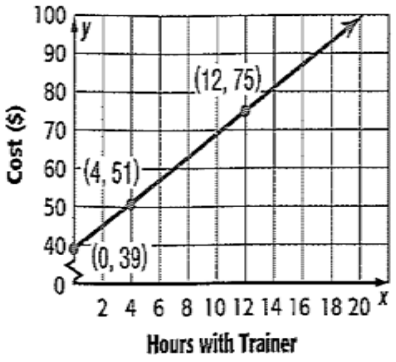
Holbrook: _____

Easton: _____

Make a valid comparison based on the given information.

Lesson 3: Classwork/Homework

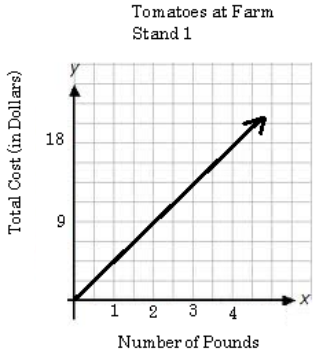
1) Sean and Ryan each have a membership to the gym. Sean's membership is represents by the function $y = 3x + 29$, where x represents the hours with a trainer, and y represents the cost. The cost of Ryan's membership is shown in the graph.



a) Compare the y-intercepts and rate of change.

b) What will be the total cost for Sean and Ryan if they each have 4 hours with a trainer?

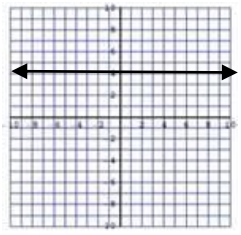
2) Cassie has to buy several pounds of tomatoes at the farmer's market. The graph shows the cost of buying tomatoes at Farms Stand 1. The equation y = 4x gives the cost of buying x pounds of tomatoes at Farm Stand 2. Which farm stand offers the better price?



3) Which equation represents a direct proportion?

A) y = x – 2 B) y = x + 2 C) $y = \frac{2}{x}$ D) y = 2x

4) What is true of the given graph?

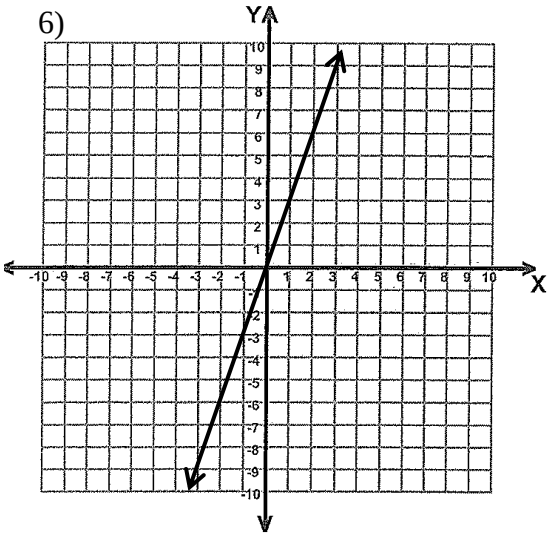


A) The slope is positive
B) The slope is four
C) The slope equals zero
D) The slope is undefined

5) Solve for y: $10x + 2y = 18$

---

6)



A) Write the equation of the line

B) Make a table from the line

x	y

C) Create a situation to represent this graph

_____

_____

Solve for the variable and identify the type of solution

7) $5x + 8 = 5(x + 3)$

8) $9x = 8 + 5x$

9) $6x + 12 = 6x + 12$

Classify each polynomial as either a monomial, binomial, or trinomial.

10) $2x^2 + 3x - 1$

11) $6xy$

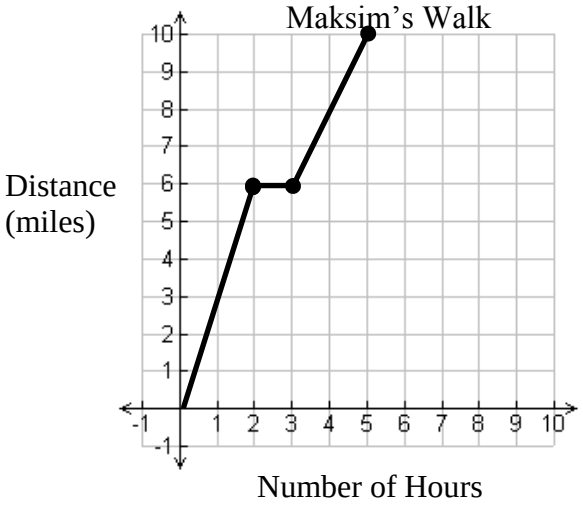
12) $-7m^5$

13) $5y^2 - 2$

Lesson 4
Interpreting Graphs

Examples:

1) On Thursday, Maksim went for a long nature walk, stopping for lunch at one point. The graph below represents his walk.



Describe what Maksim did during each interval.

a) Rate of change for the first piece of the graph. _____

b) Rate of change for the second piece of the graph. _____

That is probably when he _____.

c) Rate of change for the third piece of the graph. _____

d) What is the difference between the first piece and the third piece? Why do you think this happened?

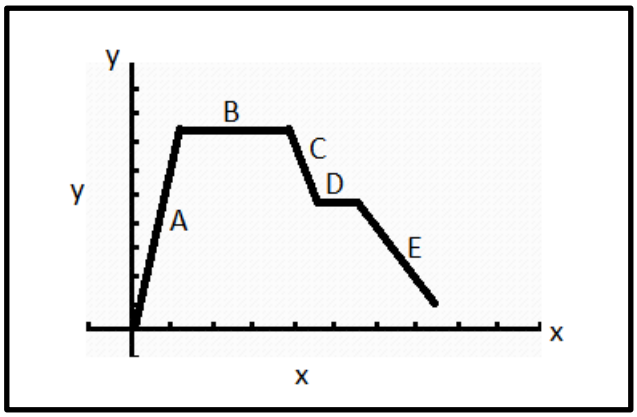
_____

_____

_____

_____

2) The graph below represents the number of people in an outdoor stadium for a baseball game. Tell what the x- and y-axes represent. Tell what happens during part A to E to the people at the game.



x: _____

y: _____

A: _____

B: _____

C: _____

D: _____

E: _____

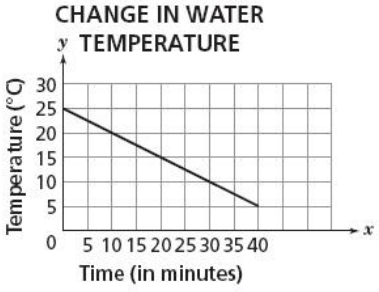
How could a graph such as this be valuable to the owners of the baseball team? Explain.

_____

_____

_____

3) Explain a situation which the graph could represent:



_____

_____

_____

_____

What is the equation of the line?

_____

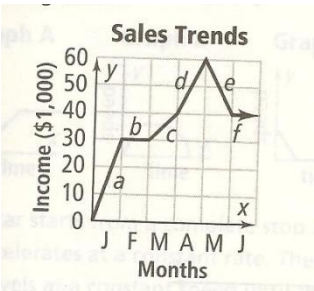
Try These:

1) What is the rate of change for interval A?

2) Explain what you think may have happened during interval C.

3) If the rate of change for interval A had remained constant throughout the whole marathon, how long would it have taken Karen to finish 26 miles?

4) a) List the type of interval on the graph by writing the letters below the correct heading below.



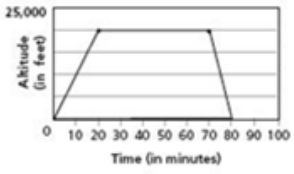
Increasing Constant Decreasing

_____ _____ _____

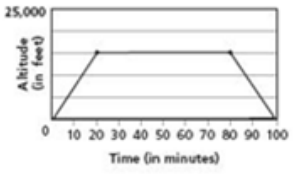
b) What was the total change in income from the beginning of march through the end of April? _____

c) What was the total change in income from the beginning of March through the end of May? _____

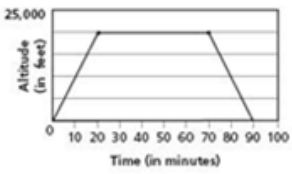
5) Enrique is taking a plane trip. The plane will take off and ascend for about 20 minutes, maintain a constant attitude for about 50 minutes, and then descend for about 20 minutes before landing. Which graph shows Enrique's trip?



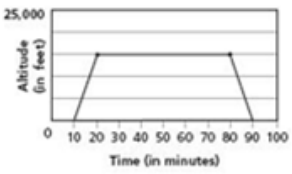
A



B



C



D

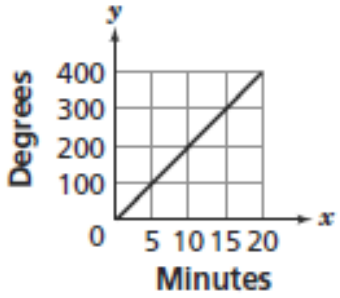
Lesson 4: Classwork/Homework

1) Wendy draws the graph below to represent a situation.

Which statement correctly interprets the graph?

A) Wendy's cup collection is decreasing over time.
B) Wendy's cup collection is increasing at a rate of 10 cups per month
C) Wendy's cup collection is increasing at a rate of 5 cups per month
D) Wendy's cup collection is increasing at a rate of 1 cup every two months

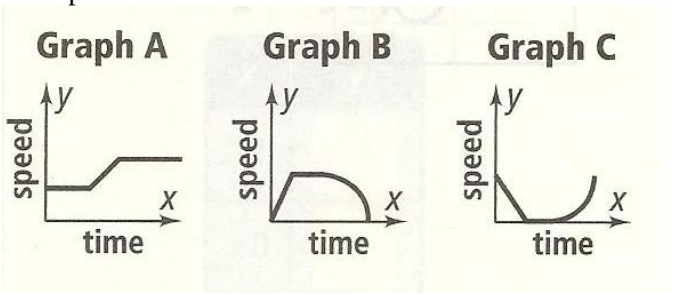
2) John drew the graph below to represent a situation.



Which statement could describe the situation John graphed?

A) The temperature of a TV dinner cooking in a microwave increases 100 degrees every minute.
B) The temperature of a TV dinner cooking in a microwave increases 20 degrees each minute.
C) The temperature of a TV dinner cooking in a microwave decreases 15 degrees each minute.
D) The temperature of a TV dinner cooking in a microwave decreases 20 degrees each minute.

3) Write the letter of the graph that matches each description in a-c



a) A car starts from a complete stop and accelerates at a constant rate. Then it travels at a constant speed unit the driver sees a stop sign and gradually slows down to a stop.

_____

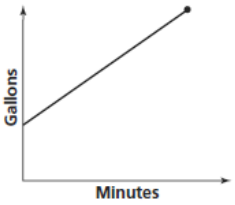
b) A car is traveling at a constant speed. It accelerates at a constant rate. Finally, it continues traveling at a constant speed.

_____

c) A car slows down at a constant speed as is approaches a red light. After a short time, the light changes and the car gradually accelerates.

_____

4) On the lines below, describe a situation that can represent the given graph.



_____

_____

_____

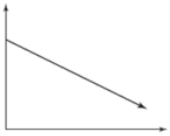
_____

_____

_____

_____

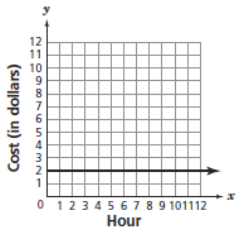
5) Which situation is best represented by the graph below?

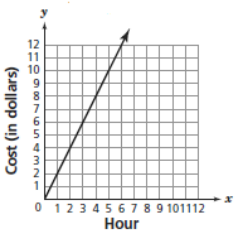


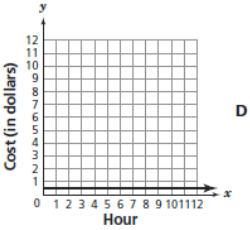
A) A student's homework average if they do not do their homework.
B) The volume of a balloon as it is being filled with air.
C) The height of a tree as it grows.
D) The path a rocket follows as it is shot into the air.

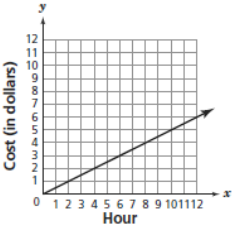
---

6) Michelle and Adam pay their babysitter $2 an hour to babysit their child. Which graph correctly shows the relationship between the number of hours the babysitter works, x, and the total cost in dollars, y?

A 

B 

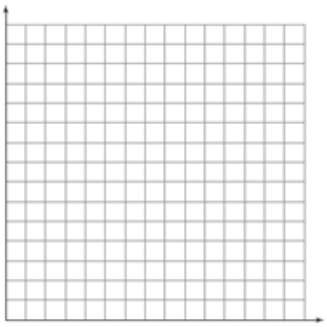
C 

D 

---

7) Danielle walks one mile every two hours. On the grid below, create a graph that shows the situation and the relationship between the number of miles she walks and the number of hours it takes her to walk.

Be sure to title your graph, label the axes, and graph all data



Review Work:

8) Solve: $2x + 8 = 2x - 5$

9) Compare the given statement using <, >, =. 8^0 _____ $\frac{8^3}{1^3}$

10) Which has a greater rate of change: $y = 2x - 4$ or $2y = -6x + 10$

Lesson 5
Constructing a Scatter Plot

Vocabulary:

Scatter plot – A graph of paired data in which the data values are plotted as points in the (x, y) format.

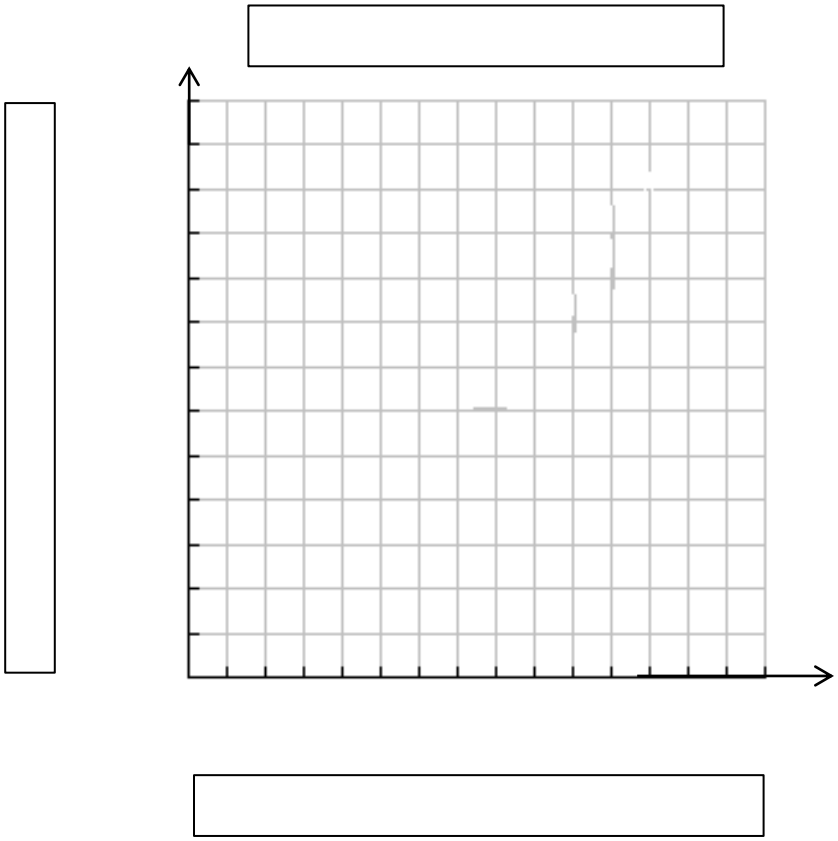
Rules:
1 - Make an (x, y) table
2 - Make a graph: Be sure to
- Title the graph
- Label the x and y axes
- Use a consistent and appropriate scale.

3 - Plot the points

Examples:

1) The owner of a diner wanted to find out if outside temperature affects soup sales. Create a scatter plot from the table below.

	Temperature (in F)	30	32	35	40	40	45	54	60	64	68
	Bowls of Soup Sold	8	50	42	42	38	28	22	15	16	5

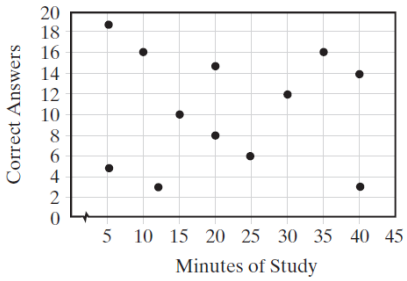


After graphing a scatter plot, you must be able to determine if the association is **linear or non-linear.**

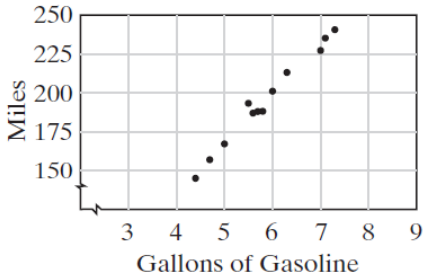
Examples:

For each scatterplot, tell whether the association is linear or non-linear.

1)



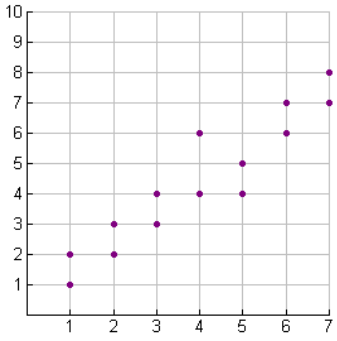
2)



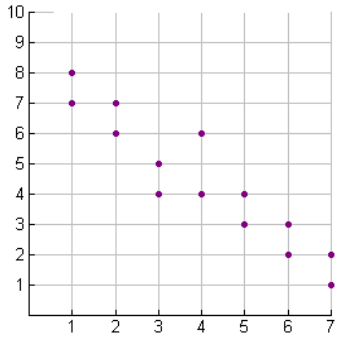
Also, you must be able to determine if the association is **positive, negative, or no association (correlation).**

For each scatterplot, tell whether the association is positive, negative, or no association.

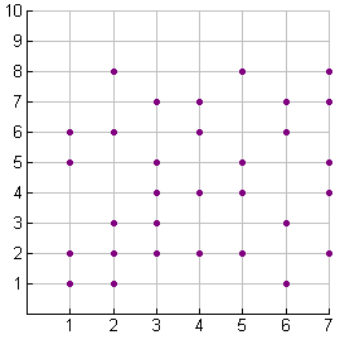
3)



4)

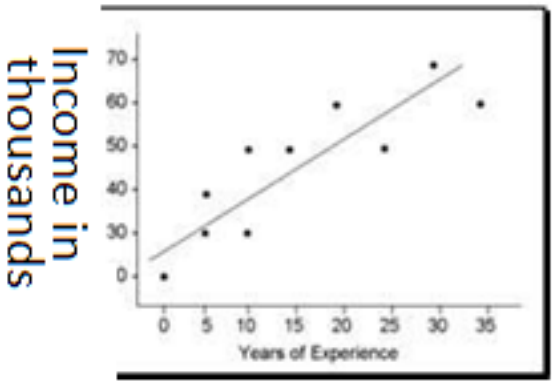


5)



Lastly, you must be able to answer questions and make predictions from your graph.

6) What does the point (25,47) represent in the graph below?

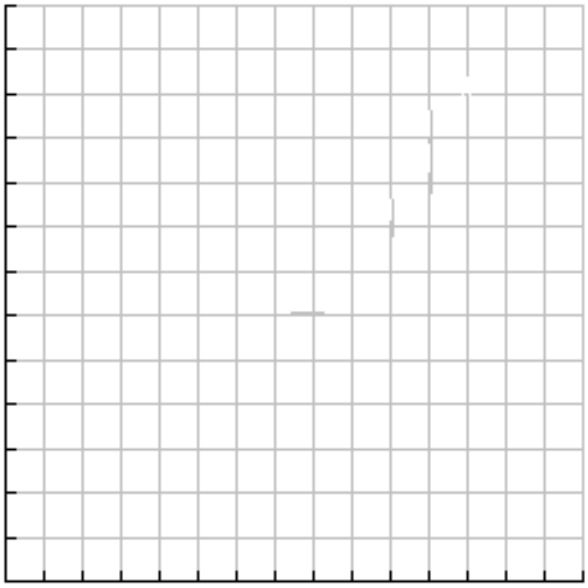


Try These:

1) The table below shows the number of minutes shoppers spent in a supermarket and the amounts each spent during that shopping trip. Make a scatter plot from the table.

Time and Total Spent

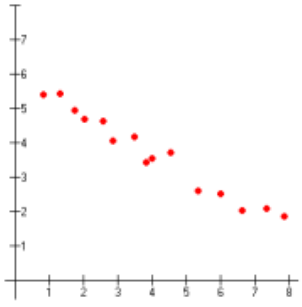
Time in Minutes	Total in Money
10	$20
30	$80
50	$120
20	$40
60	$150
30	$60
40	$90
70	$180
60	$20
50	$140



2) Describe the association shown in your scatter plot, in as many ways as possible.

_____

3) Which best describes the trend show in the scatter plot?



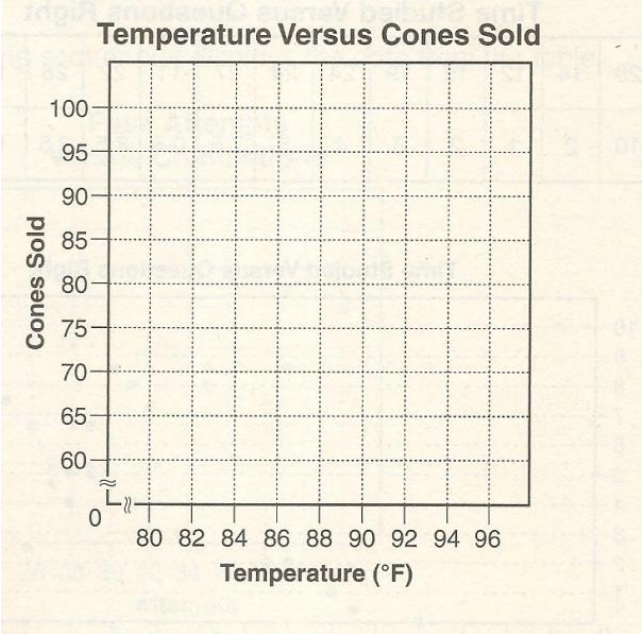
A) positive trend
B) no trend
C) negative trend
D) positive and negative trend

Lesson 5: Classwork/Homework

1) Christina works at the ice cream shop during summer vacation. She uses the following table to record the highest temperature each day for two weeks and the number of ice cream cones she sold on each of those days.

Temperature (F)	85	87	91	95	88	83	80	82	88	90	93	85	87	83
Cones Sold	76	77	70	60	91	79	67	73	78	87	92	95	85	68

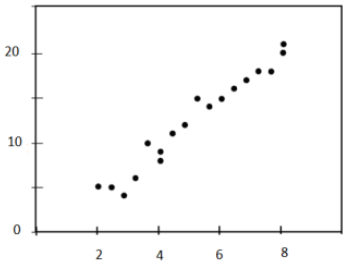
a) Use the information in from the table to create a scatter plot of the data.



b) What type of correlation does the graph represent?_____

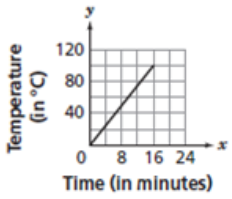
c) Are there any outliers in the data? If so, what are the ordered pairs of the points?_____

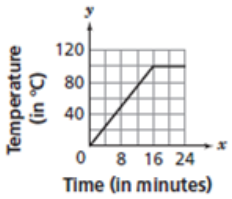
2) Which relationship could be represented by the scatter plot below?

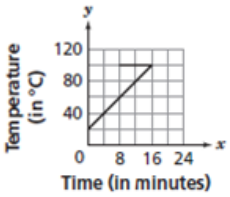


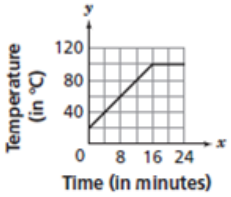
A) The relationship between length of hair and the length of fingernails
B) The relationship between inches of monthly snowfall and the number of sunny days
C) The relationship between a student's distance from school and the time it takes her to get to school
D) The relationship between hours spent studying and the number of incorrect answers on a test

3) Which graph could represent the relationship between the time, in minutes, water in a pot is heating, x, and the temperature of the water, y, if the beginning temperature of the water is 0 degrees and once the temperature gets to 100 degrees it remains at that temperature?

A 

B 

C 

D 

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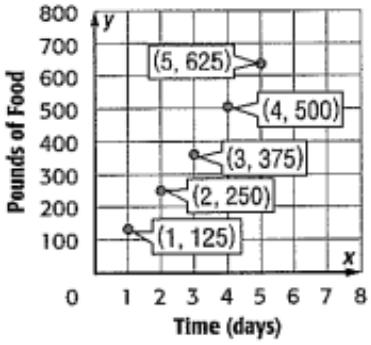
4) A tiger in captivity is fed 13.5 pounds of food a day. The graph shows the pounds of food an elephant in captivity eats per day. Compare the functions by comparing their rates of change.



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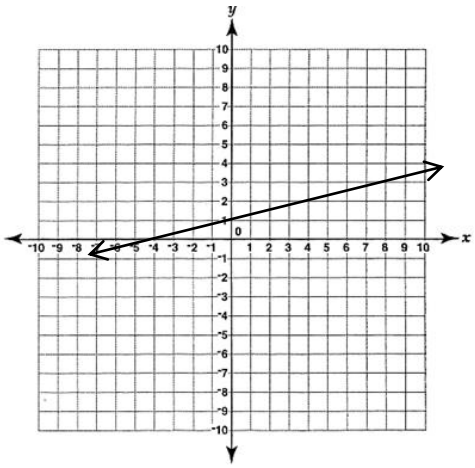
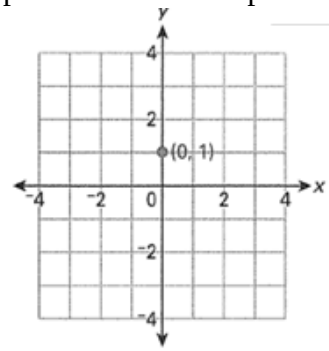
5) 

What is the slope of the line?

A) -4 B) 4 C) $\frac{1}{4}$ D) $-\frac{1}{4}$

---

6) Alisha needs to graph y = -2x + 1. So far, she has plotted (0, 1) as shown below. Which is the next point Alisha could plot?



A) (1, -1) B) (1, 3) C) (2, 0) D) (2, 2)

Lesson 6
Trend Line (Line of Best Fit)

Vocabulary:

Trend line – A line that models the relationship between two variables in a scatter plot; also called a **line of best fit.**

If the data points on a scatter plot shows a **linear** association, you can draw a **straight line** that models the general trend of the data. This line of **best fit, or trend line**, will probably not fit all the data points exactly. However, if the line you draw is a good fit, it will be close to **most** of the data points.

Outlier – A data point with a value that is very different from the other data points in the set.

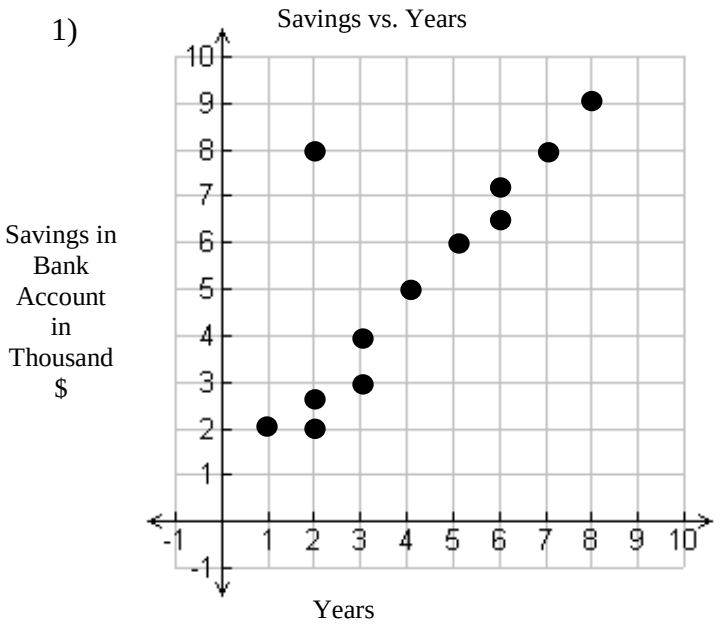
Rule:
1 - Make an (x, y) table
2 - Make a graph: Be sure to
- Title the graph
- Label the x and y axes
- Use a consistent and appropriate scale.

3 - Plot the points
4 - Draw a Line of Best Fit (Trend Line): Be Sure to
- Intersect the y axis at an exact point.
- Figure out a slope that intersects as many data points as possible.

5 - Write the equation of the line

Examples:

1)



a) Draw a trend line for the data.

b) Does the trend line show a negative, positive, or no correlation? _____

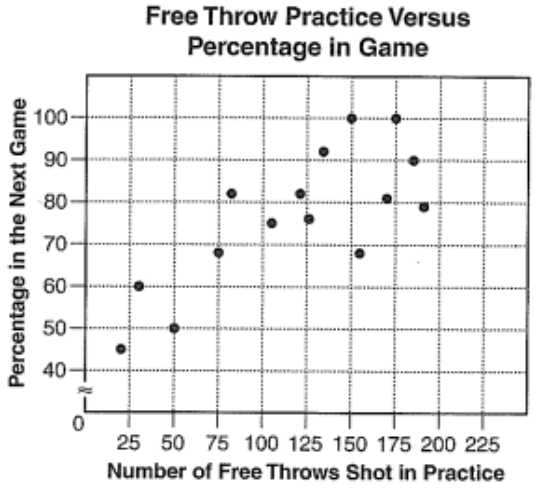
c) Does the trend line show a linear association or a nonlinear association?
_____

d) What information do we need in order to determine the equation for the trend line?
_____

e) What is the equation of the line of best fit?
_____

e) Name one outlier _____

2) Joey kept track of the number of free throws that his team shot in a practice and the percentage that they made in the next game. He displayed his finding in the scatter plot shown below.



a) Draw a trend line for Joey's data.

b) Does the trend line show a negative, positive, or no correlation? _____

c) Does the trend line show a linear association or a nonlinear association? _____

d) What information do we need in order to determine the equation for the trend line?
_____

e) What is the equation of the line of best fit? _____

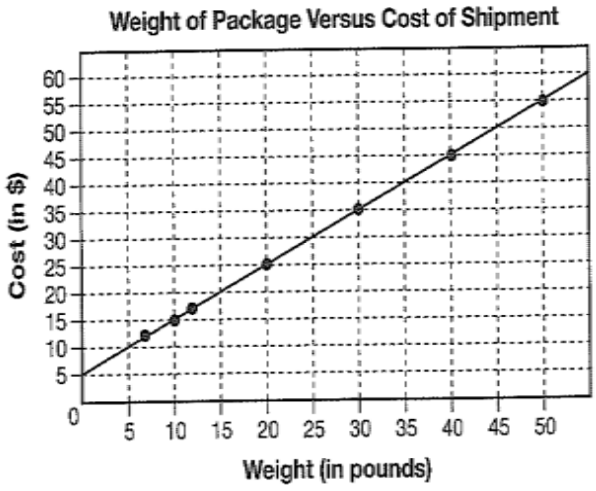
e) A student takes 60 free throws during practice. Using the equation for the line of best fit, find the free throw percentage that the student is likely to have during the next game. _____

f) Identify three outliers. _____

g) What is an outlier? _____

---

3)



A) What is the equation of the trend line drawn?

_____

B) Based on this trend, what is the cost of 60 lbs?

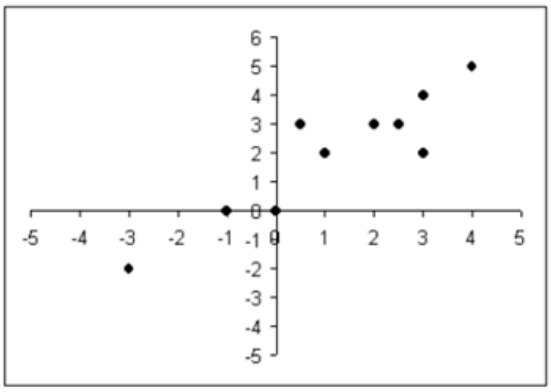
_____

B) If the cost is $40, what is the shipment weight?

_____

Try These:

1) The graph shows a scatter plot of data in the x-y coordinate plane.



A) Sketch a line of best fit

B) Which of the following best represents the equation of the line of best fit for the data in the graph?

(A) $y = x + 2$ (B) $y = -x + 1$
(C) $y = 2x + 1$ (D) $y = x + 1$

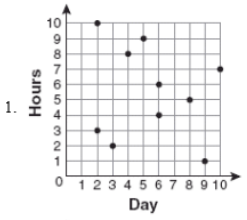
C) State the coordinates of one of the outliers. _____

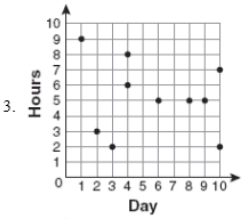
D) What makes it an outlier?
_____

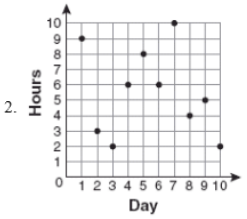
2) For 10 days, Romero kept a record of the number of hours he spent listening to music. The information is shown in the table below.

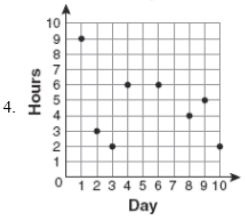
Day	1	2	3	4	5	6	7	8	9	10
Hours	9	3	2	6	8	6	10	4	5	2

A) Which scatter plot shows Romero's data graphically?

1.


3.


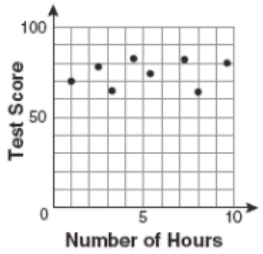
2.


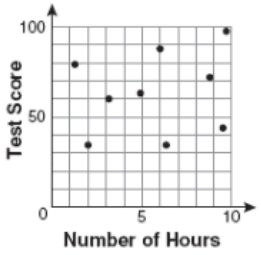
4.


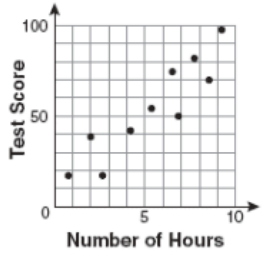
B) Which graph, if any, have a linear relationship?

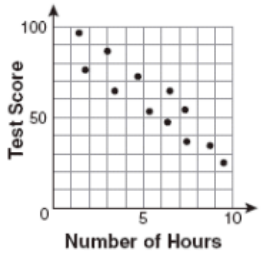
_____

3) There is a negative correlation between the number of hours a student watches television and his or her social studies test score.

1.


3.


2.


4.


A) Which scatter plot below displays this correlation?

_____

B) Draw a line of best fit for answer choice 2. What is the equation of the line you drew?

_____

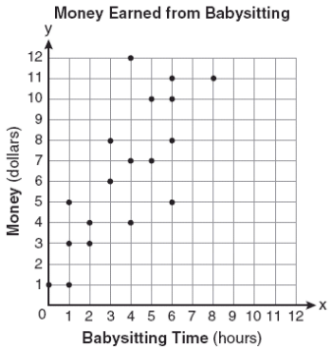
C) Draw a line of best fit for answer choice 1. What is the equation of the line you drew?

_____

(D) When comparing the lines of best fit in answer 1 and answer 2, which has a greater rate of change? _____

Lesson 6: Classwork/Homework

1) Below is a graph displaying the money earned by Susie from babysitting.



A) Which equation most closely represents the line of best fit for the scatter plot?

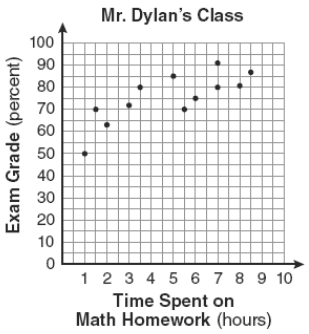
1. $y = x$
2. $y = \frac{2}{3}x + 1$
3. $y = \frac{3}{2}x + 4$
4. $y = \frac{3}{2}x + 1$

B) What type of correlation is displayed by the data? _____

C) Based on the equation found, how much would Susie earn if she worked for 10 hours? _____

---

2) The number of hours spent on math homework each week and the final exam grades for twelve students in Mr. Dylan's algebra class are plotted below.

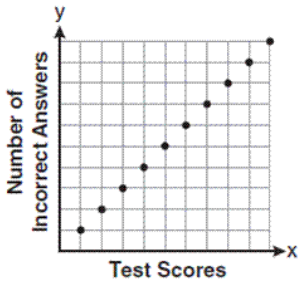


A) Based on a line of best fit, which exam grade is the best prediction for a student who spends about 4 hours on math homework each week?
(1) 62 (2) 72 (3) 82 (4) 92

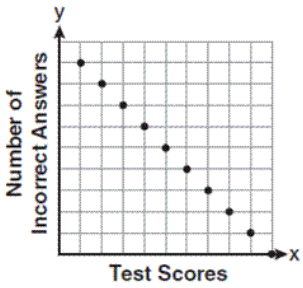
B) What is the equation of the line of best fit? _____

C) Is the data linear or nonlinear? _____

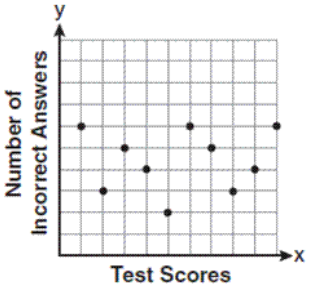
3) Which scatter plot shows the relationship between *x* and *y* if *x* represents a student score on a test and *y* represents the number of incorrect answers a student received on the same test?



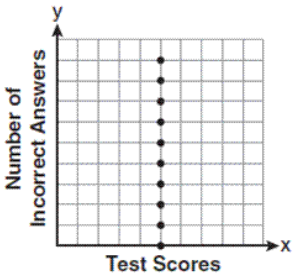
(A)



(B)



(C)



(D)

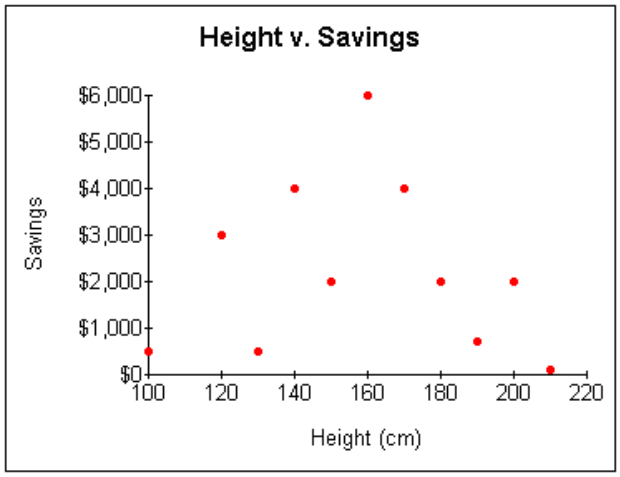
4) In question #3, what type of slope does Choice (D) have? _____

5) In question #3, write the equation of the line created in Choice D. _____

6) In question #3, which Choice would not have a linear relationship? _____

---

7) Below is a graph that compares the height of people versus their savings.



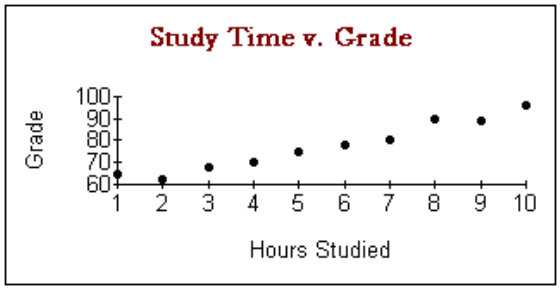
A) Which statement best describes this situation?
(1) The taller someone is, the more money is saved.
(2) The taller someone is, the less money is saved.
(3) There is no correlation to height and savings

B) TRUE OR FALSE: If you are 160cm tall, that means you must have $6,000 saved?

C) TRUE OR FALSE: This is a linear relationship.

---

8) The following is a graph of Study time versus grades achieved.

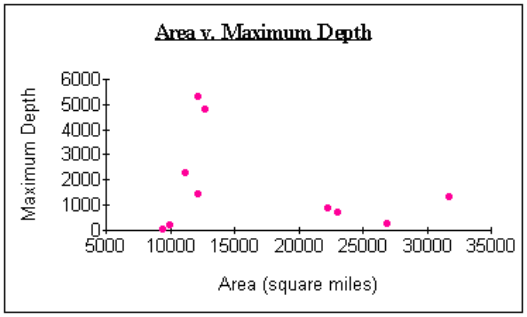


A) Draw a line of best fit (trend line)

B) What is the approximate rate of change of the line drawn?

_____

9) The scatter plot shows data for some of the largest major lakes in the world. Area and maximum depth were graphed.



What conclusion about their relationship can be drawn from the graph?
(1) As area increases, depth increases.
(2) As area decreases, depth decreases.
(3) As area increases, depth remains the same.
(4) There appears to be no relationship between area and depth.

Review Work:

10) Solve: $\frac{2}{3}x + \frac{1}{2} = \frac{5}{6}$

---

11) What is the initial value in the equation y = 3x – 5?

---

12) What is the equation 2x + y = 9 written in slope-intercept form? What is the rate of change?

---

13) Simplify $(4x^3)^2 (3x^5)$

Lesson 7
Making a 2 Way Frequency Tables

Vocabulary:

Two-Way Table of frequencies is useful for organizing and displaying data that pertains to different categories.

The **Frequency** of an item is the number of times the item occurs.

Relative Frequency Table - represents data as a decimal or percent.

Examples: Two-Way Frequency Table (Bivariate data)

1) You survey friends about the type of party they enjoy most.

Gender

Party Type	Male	Female	Total
Bowling	6	2	8
Skating	3	11	14
Dancing	1	3	4
Total	10	16	26

What type of party would you plan for them? Explain.

Write a valid conclusion from the graph. _____

_____

_____

_____

2) Eighth grade students were asked whether they participate in an after-school activity. Complete the two-way frequency table below.

After-school Activity

Gender	Yes	No	Total
Male		40	
Female			95
Total	102		187

3) Sagamore students were polled about whether or not they owned an I-POD. The results of the **Relative Percentage** are shown below in percentage form. Complete the chart below.

Grade	I-POD		
	Yes	No	Total
7th	42%		75%
8th			
Total	55%		100%

a. Did more students have I-Pods or not?

*** CHALLENGE ***

b. If there were a total of 88 students, how many were 8th Graders?

---

4) The chart below represents the **Relative Frequency** of people who own an I-Pod. Complete the two-way frequency table.

	I-POD		
	Yes	No	Total
Students	.51		.70
Adults	.27		
Total			1.00

Creating a **Relative Frequency** table based on TOTAL people.

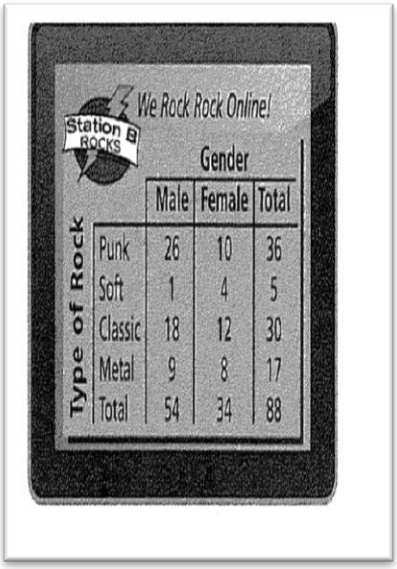
5) Below is a table of people in the park and the activities that they do. Complete the relative frequency table below, based on the total participants. First, complete the table.

Activity	Jog	Fly Kites	Picnic	Total
Male	9	4	10	
Female	11	1		
Total			25	50

To create a relative-frequency two-way table for **all 50 people**, divide each number in each cell by 50

Topping	Jog	Fly Kites	Picnic	Total
Male				
Female				
Total				

Try These:



1) a) What is the most popular type of rock among men and woman? _____

b) What type of rock do females like the most? _____

c) What is the least favorite rock for men? _____

d) How many people were surveyed? _____

e) For which gender was the response greater? _____

2) You go to a dance and help clean up afterwards. To help, you collect the soda cans, Coca-Cola and Sprite, and organize them. Some cans were on the table and some were in the garbage. Seventy-two total cans were found. 42 total cans were found in the garbage and fifty total cans were Coca-Cola. 14 Sprite cans were found on the table. Complete the chart

Party Type	Coca-Cola	Sprite	Total
Table			
Garbage			
Total			

3) Now, complete a relative frequency table based on the TOTAL number of cans (72).

	Coca-Cola	Sprite	Total
Table			
Garbage			
Total			

4) Below is a partial list of the relative frequency table of the results of a classroom poll. Complete the chart.

STUDY FOR THE TEST

	Yes	No	Maybe	Total
Boys	.25	.15		.56
Girls			.16	
Total	.52	.16		1.00

4a) If there were a total of 50 students, how many said YES, they will study for the test. _____

4b) If there were a total of 50 students, how many GIRLS said MAYBE? _____

Lesson 7: Classwork/Homework

1) Eighth grade students who were going to the movies Friday night.
Complete the two-way frequency table below.

After-school Activity

Gender		Yes	No	Total
	Male		20	
	Female			33
	Total	37		75

2) Eighty students at Sagamore Middle school were surveyed whether they own an I-Pod. Half of the 50 eight graders said yes, and 28 of the seventh graders said yes. Complete the two-way frequency table.

	Yes	No	Total
7^{th} Grade			
8^{th} Grade			
Total			

3) The table shows the results of a survey about what the engineers said their favorite subject was in middle school.

	Math	Science	Total
Electrical	85	90	175
Chemical	80	91	171
Mechanical	89	81	170
Total	254	262	516

a) How many chemical engineers chose science? _____

b) How many engineers chose math? _____

c) Overall, what was the favorite subject of all engineers? _____

4) A survey of students in a homeroom class explored the relationship between gender and participation in the school band.

	Boys	Girls	Total
In Band	4	8	12
Not in Band	9	5	14
Total	13	13	26

Which is a reasonable conclusion to draw from these data?

A) The are more band members in the class than non-band members.
B) There are more boys in the class than girls.
C) Among the boys, there are more boys in the band than Not in the band.
D) More than one-half of the band members in the class are girls.

5) A survey of randomly selected Sagamore students explored the relationship between gender and video game play. Which is not a reasonable interpretation of the data?

	Boys	Girls	Total
Play Daily	45	12	57
Do Not Play Daily	5	38	43
Total	50	50	100

A) More boys surveyed play video game daily than girls.

B) Ignoring gender, a little more than half of the students surveys play video games daily

C) Of the boys surveyed, 5% do not play video games daily

D) Of the girls surveyed, exactly 24% play video games daily

---

6) The following two-way table shows the number of students who voted for each of the two candidates for class president, by grade.

Candidate	**Grade 7**	**Grade 8**	**Grade 9**
Zoe	45	20	65
Alessandro	30	60	90
Total	75	80	155

How many more 8th graders voted for Alessandro than Zoe?

A) 15 B) 20 C) 40 D) 80

---

7) The following two-way table shows the number of different color cars and SUV's at an auto dealership.

Color	**Car**	**SUV**	**Total**
Red	25	15	40
White	15	10	25
Blue	40	20	60
Green	20	5	25
Total	100	50	150

What color is the least popular car in the dealership?

A) White B) Red C) Green D) Blue

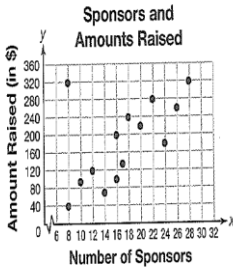
Review Work:

8) A farmer charges for his coffee beans using the equation C = 3.95p, where C is the cost of the coffee beans and p is the number of pounds of coffee beans. What is the slope? _____

---

9) Which best describes the association, if any, that is shown?

A) positive association C) no association
B) negative association D) non-linear association



Lesson 8
2 Way Relative Frequency Tables

Vocabulary:

Relative Frequency Table - represents data as a decimal or percent.

Relative Frequency Tables can be created:
1) **By Total Number**
2) **By Row**
3) **By Column**

Examples:

1) Fifty students in the 8th grade class were asked what kind of ice-cream they like (vanilla or chocolate) and what kind of toppings they like (sprinkles, m & m's, or nothing). Identify any trends in the data.

Topping	Sprinkles	m & m's	Nothing	Total
Vanilla	9	8	13	30
Chocolate	7	9	4	20
Total	16	17	17	50

_____
_____
_____

2) To create a relative-frequency two way table for the **rows**, divide each number in each row by the total in that row.

Topping	Sprinkles	m & m's	Nothing	Total
Vanilla				
Chocolate				

3) To create a relative-frequency two way table for the **columns**, divide each number in each column by the total in that column.

Topping	Sprinkles	m & m's	Nothing
Vanilla			
Chocolate			
Total			

4) To create a relative-frequency two way table with **percents**, change each decimal to a percent.

Topping	Sprinkles	m & m's	Nothing	Total
Vanilla				
Chocolate				
Total				100%

Try These:

1) Jeremy asked a sample of 40 8th grade students whether or not they had a curfew. He then asked if they had a set bedtime for school nights. He recorded his data in this two-way frequency table. Create a two-way relative frequency table for these data.

	Bedtime	No Bedtime	Total
Curfew	21	4	25
No Curfew	3	12	15
Total	24	16	40

	Bedtime	No Bedtime	Total
Curfew			
No Curfew			

2) The table shows the grade levels and primary home languages for all the students at Martin Middle School.

	6th Grade	7th Grade	8th Grade	Total
English	104	99	116	319
Other	56	81	84	221
Total	160	180	200	540

Use the grid below to create a two-way relative frequency table.

	6th Grade	7th Grade	8th Grade
English			
Other			
Total			

3) A recent poll asked whether customers like a restaurant's new lunch menu. Complete the corresponding relative frequency table with respect to the total population.

Frequency Table
New Menu

	Yes	**No**	**Total**
Male	13	15	28
Female	18	25	43
Total	31	40	71

Total Relative Frequency Table
New Menu

	Yes	**No**	**Total**
Male			
Female			
Total			

4) Lucia asked 50 eighth-grade students if they agreed or disagreed with a proposed plan to start the school day at a later time. She also recorded whether each student responding was a boy or girl. Make several observations about the data. Create a two-way relative frequency table for these data:

	Boys	Girls	Total
Agree	14	12	26
Disagree	6	18	24
Total	20	30	50

	Boys	Girls	Total
Agree			100%
Disagree			100%

Lesson 7: Classwork/Homework

1) Circle the table that will be more helpful in finding whether male or female teenagers are more likely to own a car.

Frequency Table
Car Ownership

	Yes	**No**	**Total**
Male	49	126	175
Female	48	102	150
Total	97	228	325

Total Relative Frequency Table
Car Ownership

	Yes	**No**	**Total**
Male	28%	72%	100%
Female	32%	68%	100%
Total	29.8%	70.2%	100%

Justify your answer: _____

_____

_____

2) Fifty moviegoers were surveyed about their favorite movie types.

- 13 men and 6 women chose "Action"as their favorite type.
- 8 men and 8 women chose "Drama"as their favorite type.
- 5 men and 4 women chose "Comedy"as their favorite type.
- 4 men and 2 women chose "Animated"as their favorite type.

Draw a two-way frequency table using the above data. Use the table to determine the most popular type of movie in the survey.

	Action	Drama	Comedy	Animated	Total
Men					
Women					
Total					

Which type of movie surveyed is most popular? _____

3) The frequency table shows the hair and eye color of 25 students. Is there evidence that blue eyes are more common for students with blond hair than those with black hair?
Write a valid conclusion. _____

_____

	Blond	Black	Brown	Total
Blue	3	1	2	6
Brown	2	7	6	15
Green	1	1	2	4
Total	6	9	10	25

	Blond	Black	Brown	Total
Blue				
Brown				
Green				

4) Complete the table.

	Football	Baseball	Total
Coaches	5	7	12
Players		6	
Total	12		

5) How many coaches participated in the survey?

6) How many players participated in the survey?

7) Which sport is more popular among the coaches?

8) Which sport is more popular among the players?

9) Twenty students were surveyed about their favorite subject. Below are the results.

- 3 boys and 4 girls chose Math
- 2 boys and 3 girls chose Science
- 1 boys and 2 girls chose ELA
- 3 boys and 2 girls chose History

Construct a two-way frequency table for the data.

	Math	Science	ELA	History	Total
Boys					
Girls					
Total					

10) According to the table, what is the least popular subject? _____

11) Construct a two way relative frequency table based on percent

	Math	Science	ELA	History
Boys				
Girls				
Total				

	For	Against	Total
Parents	.42	.07	.50
Teens	.18	.32	.50
Total	.61	.39	1.00

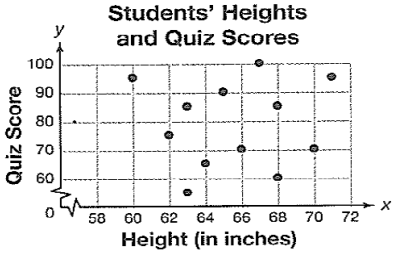
12) The two- way shows the results of a survey about whether students should be required to wear school uniforms. According to the table, what percent of teenagers are in favor of wearing school uniforms?

13) If 300 parents were surveyed, how many were for wearing uniforms?

Name _____ **Math 8 - Unit 6 Review**

For each scatter plot, describe the association shown as linear or nonlinear. If no association is shown, state that. If the association is linear, identify it as positive or negative.

1.



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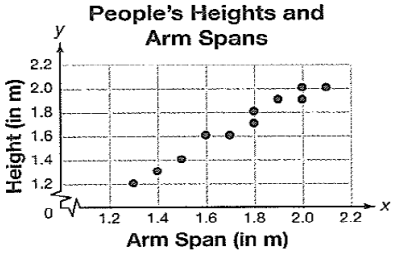
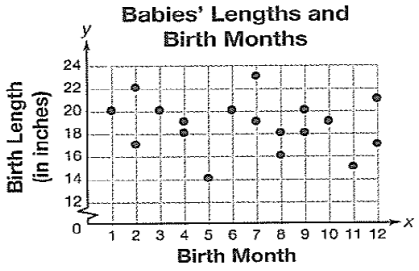
2.



_____

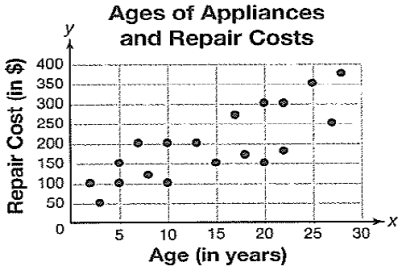
Choose the best answer.

3. The scatter plot shows the lengths of several babies and the numbers representing the months in which they were born. Which best describes the association, if any, that is shown?



A. positive association
B. negative association
C. no association
D. nonlinear association

4. The scatter plot shows the ages of appliances and the costs of repairing them. Which best describes the association, if any, that is shown?



A. positive association
B. negative association
C. no association
D. nonlinear association

---

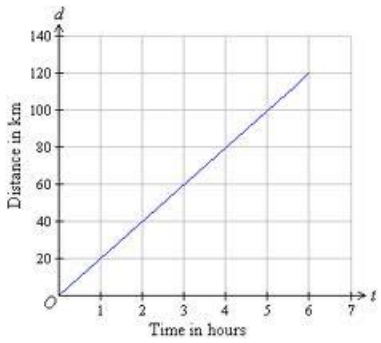
5. The late fees for a school library are resented by the function c = 0.25d, where c is the total cost and d is the number of days a book is late. The fees charged by a city library are shown in the table.

Days Late	1	2	3
Cost ($)	0.35	0.70	1.05

a) Compare the functions' y-intercepts and rates of change.

b) Shamar checks out one book at each library and returns both books 3 days late. What are the fees for each library?

6) Given the following graph, find the rate of change. Does the graph represent a direct relationship? Explain.



The maximum distance traveled by the space shuttle can be determined using the equation **d = 4.8s**, where *d* is the distance, in miles, and *s* is the number of seconds. The table shows the distance traveled by the Apollo 10 astronauts returning from the moon.

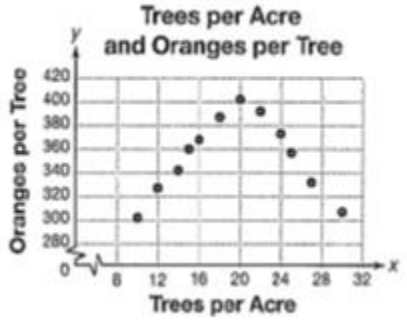
Distance Traveled by Apollo 10

Number of Seconds	Distance Traveled (in miles)
5	23.5
10	47
15	70.5
20	94

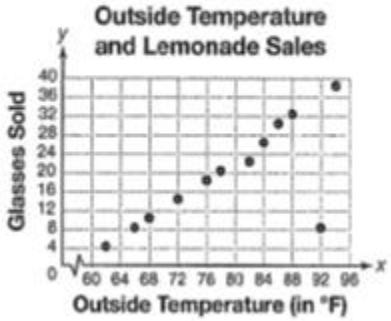
7) Compare the slopes to determine which craft – the space shuttle or Apollo 10 – traveled at a greater speed and explain the steps you took.

Describe the association shown, if any, by the scatter plot in as many ways as possible, using terms such as linear or nonlinear and positive or negative. Identify any outlier(s).

8.



9.



a) Describe the association. _____
b) Draw the trend.
c) Write equation of the trend line. _____

a) Describe the association. _____
b) Draw the trend.
c) Write equation of the trend line. _____

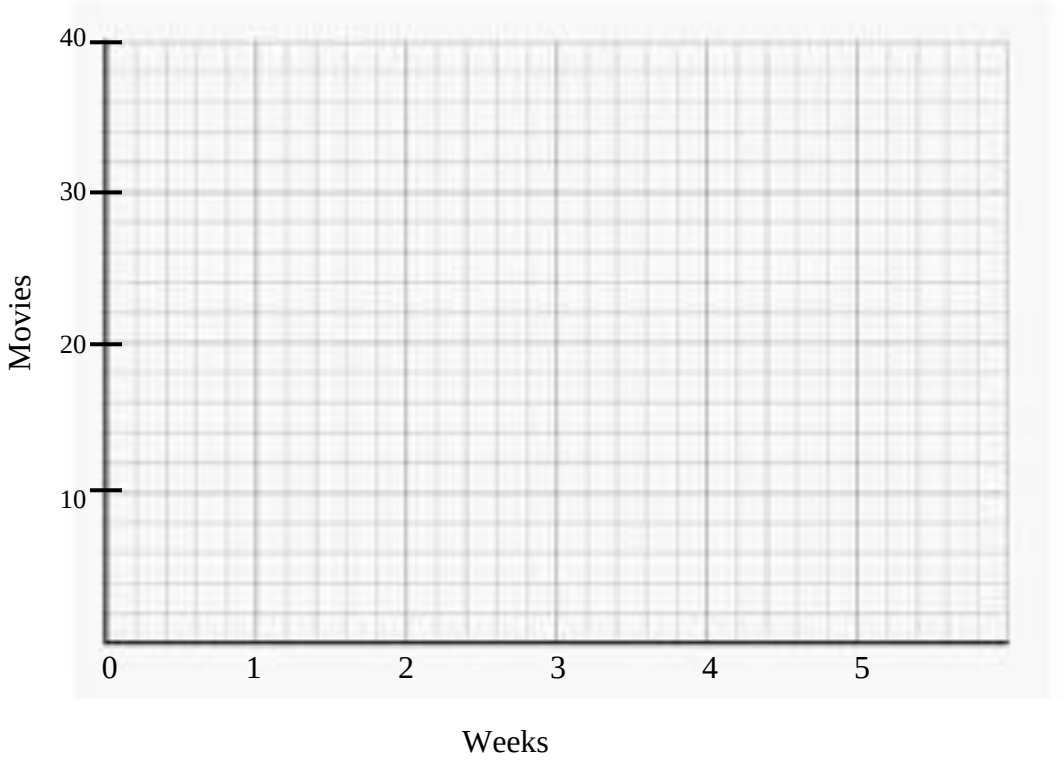
d) Identify any outlier(s) _____ d) Identify any outlier(s) _____

10) A store receives an average of 7 new movies per week.

a) Make a table to represent the number of movies rented each week

b) Graph the number of movies the store receives

Weeks, *w*	Movies, *m*



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11) The number of baskets a company produces each day is shown in the table.

Number of Days, d	Total Baskets, b
1	45
2	90
3	135
4	180

a) Write an equation to find the total number of baskets crafted in any number of days. Describe the relationship in words.

_____

_____

_____

b) Use the equation to determine how many baskets the company makes in **one non-leap year**.

12) Cathy wanted to see if there was a relationship between students' grade levels and school club participation. She made this two way table to show her results.

	One or More Clubs	Not in a Club	Total
Grade 6	6	44	50
Grade 7	23	27	50
Grade8	40	10	50
Total	69	81	150

a) Find the relative frequencies for the table above. _____

	One or More Clubs	Not in a Club	Total
Grade 6			
Grade 7			
Grade8			
Total			

b) Draw and state two conclusions about the relationships between a student's grade level and the likelihood that he or she will participate in school clubs.

_____

_____

_____

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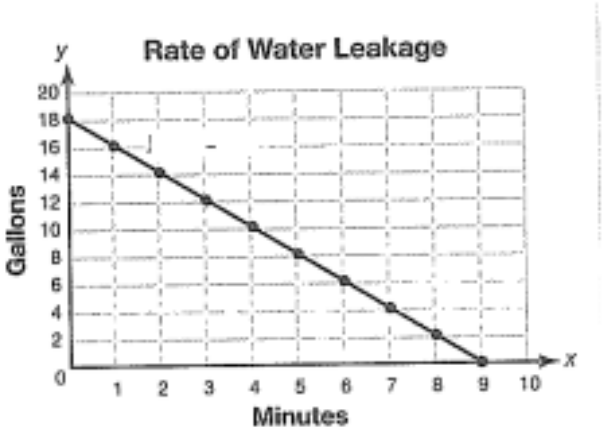
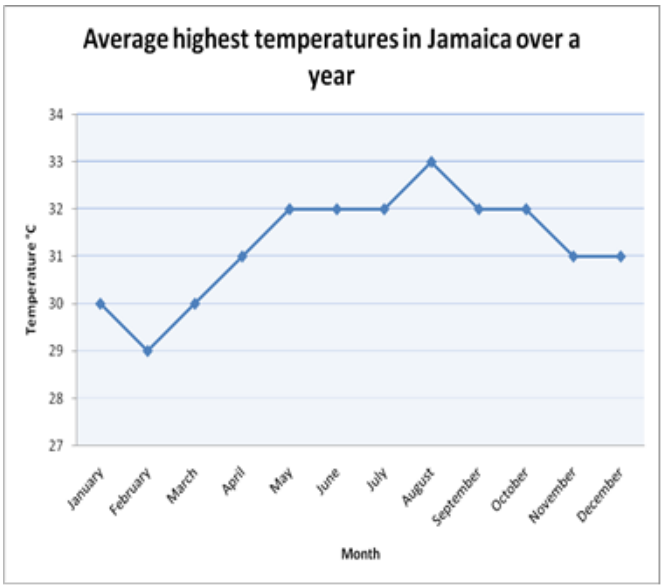
13) A water tank that holds 18 gallons leaks two gallons of water every minute. Determine the rate of change and initial value of the situation and use them to write an equation. Then graph the relationship.



Use the graph to answer the questions below.

The **line graph** shows temperatures over the year in Jamaica.



14) Which month had the highest temperature? _____

15) Which month had the lowest temperature? _____

16) What is the difference in temperature between February and May? _____

17) How many months have a temperature higher than 30°C? _____

18) What is the range of temperatures in Jamaica over the year? _____

19) Would you expect the temperature range in the UK to be similar or different? Explain your answer.

_____

_____

_____

---

20) Which equations represent proportional relationships?

A) y = 3x B) y = ½ x – 3 C) y = 7x D) y = -2x E) $y = \frac{2}{3}x$ F) y = x

Unit 1 and 2

Simplify each expression

21) $5^3 \cdot 6^7 \cdot 5^{-3} \cdot 6$ 22) $\frac{2^8 3^9 2^{-3}}{3^{10}}$ 23) $20 - 5^2 + 10$ 24) $(5x^8)^0$

Unit 3

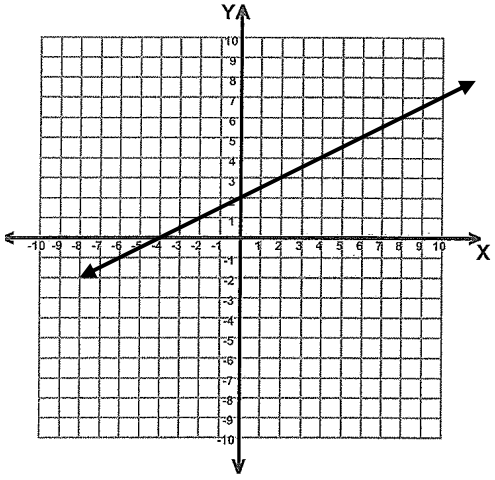
Solve each equation

25) $3x + 7 = 3(x + 7)$ 26) $4x + 5 - 4x = 4x + 5$ 27) $\frac{2}{3}x - \frac{1}{2} = \frac{5}{6}$

Unit 4

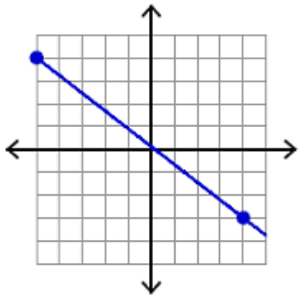
28) Given the following line, complete the table and write the equation of the line.

x	y

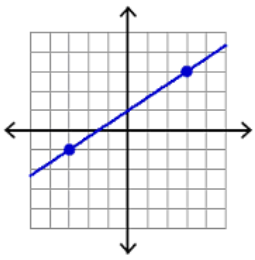


29) **Find the slope of each line.**

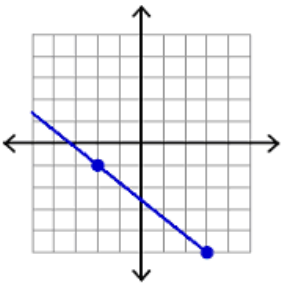
1)



2)



3)

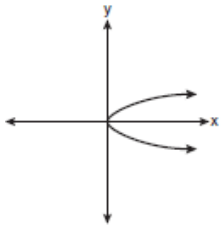


30) Given the points (3,4) and (7,9), find the slope.

31) Find the slope and y-intercept given $2x + y = 7$

Unit 5

Which of the following represents a function?

32) 

33)

Domain	Range
Beth	Dave
Sally	Mike
Lucy	Ryan
Jen	Dan

34)

Domain	Range
2	1
3	2
4	3
5	

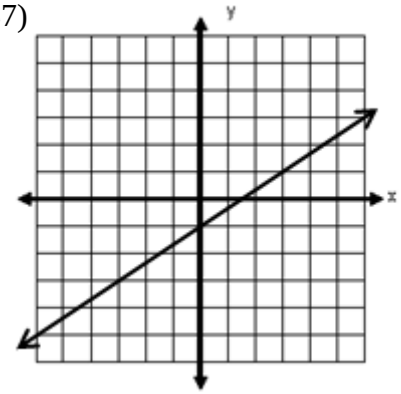
35)

x	y
1	2
5	4
7	6
9	8

_____ _____ _____ _____

Determine the rate of change.

36) 3 – x = y

37) 

38)

x	y
0	-1
2	7
4	15
6	23
8	31

Determine the number of solutions. (one solution, no solution, or infinite solutions).

39) y = 2x + 8
y = 3x – 7

40) y = -2x + 8
y = -2x – 4

41) y = 2x + 3
5y = 10x + 15

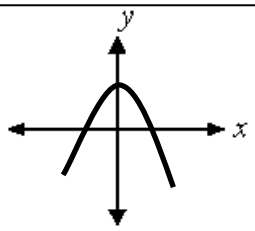
_____ _____ _____

Are the following Linear or Non-linear

42) $y = x^2 + 2x$

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

44) Getting paid $7.25 per hour

45) 

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Unit 7

Solving System of Equations Algebraically

	Date	Lesson	Topic
		1	Solving a System of Equations Algebraically – Addition Method
		2	Solving a System of Equations Algebraically – Addition Method
			Quiz
		3	Solving a System of Equations Review Addition Method
		4	Solving a System of Equations Algebraically – Addition Method
		5	Solving a System of Equations Algebraically – Substitution Method
		6	Solving a System of Equations Algebraically – Substitution Method (y = y)
		7	Solving a System of Equations Fraction and Decimal
			Quiz
		8	Types of Solutions
		9	Understanding Systems of Equations
		10	Word Problems
			Review
			Test

Lesson 1
Solving a System of Equation Algebraically – Addition Method

Review: Rules for Solving Graphically

Step 1: Graph both lines.

Step 2: Determine the solution by finding the point of intersection.

Step 3: Check the solution in both equations.

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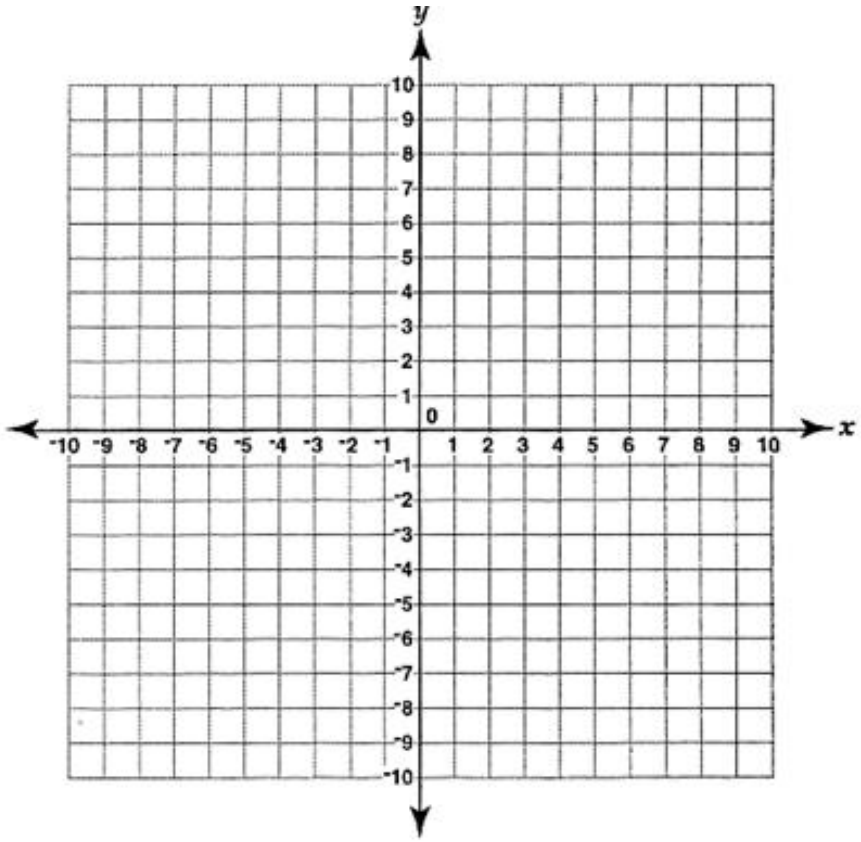
1) Graph and Check:

$y = -x + 2$ $y = 3x - 2$



Check ( ) Check ( )

Solving a System of Equation Algebraically – Addition Method

Steps	
1) Cancel out one of the variables ⇒	**Rule for canceling out a variable:**
2) Add two equations	1) Same coefficient
3) Solve the equation	2) Different signs
4) Solve for other variable by substituting the known variable	ex. 2x and -2x
5) Write the answer as a coordinate pair	
6) Check the solution in both equations	

Examples: Solve each system of equations algebraically and check.

---

1) $3x - y = 2$
$x + y = 6$

Check
$3x - y = 2$

Check
$x + y = 6$

---

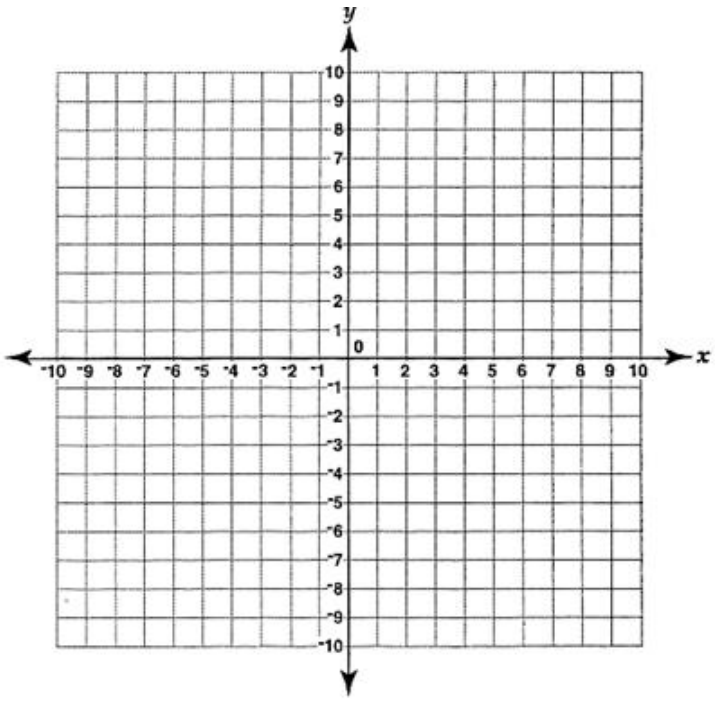
2) $3x + 2y = 7$
$-3x + y = 8$

Check
$3x + 2y = 7$

Check
$-3x + y = 8$

3) Solve **Graphically** and Check:
* Remember to solve for y

-x + y = -2 x + y = 8



Check ( ) Check ( )

4) Solve **Algebraically** Using Addition Method and Check:

-x + y = -2
x + y = 8

Check ( ) Check ( )

5) What is the difference between solving a system of equations graphically or algebraically?

Classwork: Solve each system of equations algebraically.

1) $4x - y = 8$
$2x + y = -2$

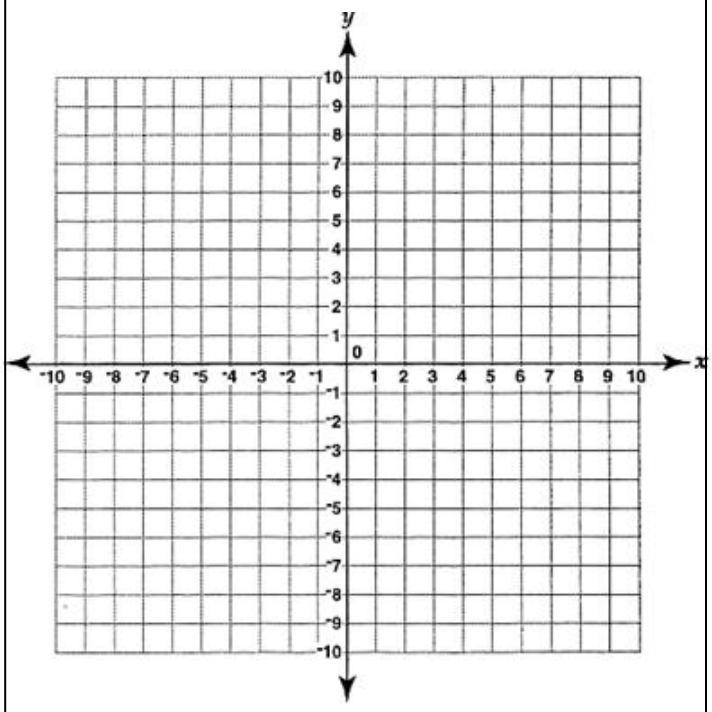
2) $x + y = 10$
$-x + y = 0$

3) $2x - y = 5$
$x + y = 4$

4) $-x + 2y = -14$
$x + 3y = 9$

5) Solve the following system graphically **or** algebraically. $x + y = 2$

$x - y = 10$



6) What method did you use to solve the above system? Explain why.

Homework: Solve each system of equations algebraically.

1) $x + y = 6$
$x - y = 2$

2) $2x + y = 5$
$2x - y = 3$

3) $x + 2y = 7$
$3x - 2y = 5$

4) $x + y = 9$
$-x + y = 5$

Review Work:

5) Solve for x: $7x + 12 = 2(x + 6)$

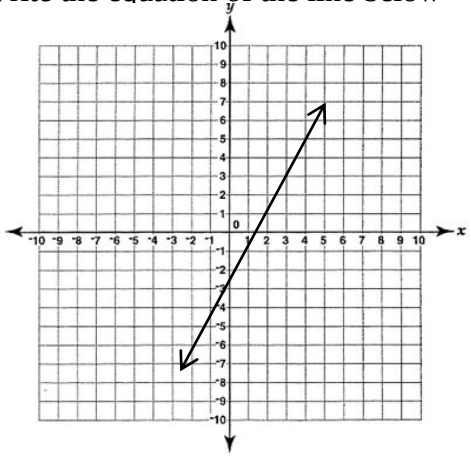
6) Simplify: $(x^4)(x)$

7) Use < , > or = to make true.

-12 ____-5

8) Write $8x^{-6}y^4$ with as a positive exponents

9) Write the equation of the line below



10) Complete the table below.

x	y = 2x - 3	y
-2		
0		
2		
4		

11) Compute.

$7(1 + 2) – 5 \div 5$

12) Evaluate.

$5(x + 3)$ when $x = 2$

Lesson 2

Solving a System of Equation Algebraically – Addition Method

Steps	
1) **Cancel out one of the variables** ⇨ 2) Add two equations 3) Solve the equation 4) Solve for other variable by substituting the known variable 5) Write the answer as a coordinate pair 6) Check the solution in both equations	**Rule for canceling out a variable:** 1) Same coefficient 2) Different signs ex. 2x and -2x

Examples: Solve each system of equations algebraically.

1) $3x + y = 16$
$2x + y = 11$

2) $x - 4y = -8$
$x - 2y = 0$

3) $4x + 5y = 23$
$4x - y = 5$

4) $x + 3y = 10$
$3x + y = 6$

Classwork: Solve each system of equations algebraically.

1) $3x - y = 3$
$x + 3y = 11$

2) $5x + 3y = 14$
$2x + y = 6$

3) $x + 2y = 8$
$x - 2y = 4$

.

4) $x - 3y = -11$
$3x + y = 17$

Homework: Solve each system of equations algebraically.

1) $2x - y = -1$
$x + 3y = 10$

2) $2x + y = 14$
$3x + y = 18$

3) $x - 2y = -2$
$2x - y = 5$

4) $x + y = 0$
$-4x - 5y = -2$

Review Work:

5) Solve for x and **identify the type of solution**.

$5x + 8 = 5(x + 3)$

Type of solution: _____

6) Simplify:

a) $5x^0$ b) $\frac{2^{-5}}{2^{-8}}$

7) Evaluate: $2a^5$ if a = 3

8) Simplify: $(2x + 4y) + (5x – 8y)$

9) Tell whether each equation represents a linear function.

a) $y = 5x – 8$ b) $y = x^2 + 2$

10) Find the function rule.

x	y
1	11
2	18
3	25
4	32
5	39
9	

11) Solve for y: $3x = y – 8$

12) Convert using the following formula:

$$F = \frac{9}{5}C + 32$$

35 ° C = _____ F

Lesson 3

Solving a System of Equation Algebraically – Addition Method

Steps	
1) **Cancel out one of the variables** ⇨ 2) Add two equations 3) Solve the equation 4) Solve for other variable by substituting the known variable 5) Write the answer as a coordinate pair 6) Check the solution in both equations	**Rule for canceling out a variable:** 1) Same coefficient 2) Different signs ex. 2x and -2x

Examples: Solve each system of equations algebraically.

1) $5x - 2y = 8$
$3x - 7y = -1$

2) $3x + 7y = -2$
$2x + 3y = -3$

3) $x + 2y = 8$
$2x - y = 1$

4) $-3x + 3y = 0$
$4x - 8y = 36$

Classwork: Solve each system of equations algebraically.

1) $3x - 7y = 7$
$4x - 3y = 22$

2) $x + y = 9$
$2x - 3y = 3$

3) $x - 4y = 3$
$-2x + y = 8$

.

4) $5x - 9y = -3$
$4x - 3y = 6$

Homework: Solve each system of equations algebraically.

1) $3x + 4y = 1$
$6x + 5y = -1$

2) $5x - 2y = 2$
$2x - 3y = 3$

3) $5x - 2y = 20$
$2x + 3y = 27$

4) $2x + y = 3$
$\frac{1}{2}x - y = 7$

Review Work:

5) Evaluate if a = -2 and b = -3

$$\frac{3a-8}{2b+4}$$

6) Write the following with a positive exponent.

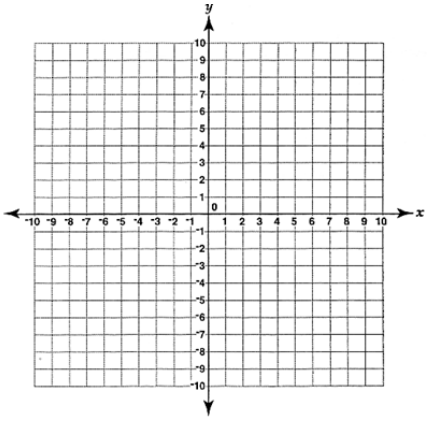
$$\left(\frac{3}{4}\right)^{-1}$$

7) Solve for x: $4(2x - 6) = 8(x - 3)$

8) How many solutions does the equation have?

$6x + 2x - 10 = 2(4x - 5)$

9) Graph the following line**:** **y = -4x + 8**



10) Which set of ordered pairs does **not** represent a function?

a) $\{(-6, 9),\ (-3, 3),\ (0, 3),\ (3, 9)\}$
b) $\{(-2, 2),\ (-4, 2),\ (-6, 2),\ (-8, 2)\}$
c) $\{(5, -1),\ (-1, 5),\ (5, 1),\ (1, -5)\}$
d) $\{(10, -10),\ (5, -5),\ (-5, 5),\ (-10, 10)\}$

11) Translate into an algebraic expression.

11 more than x times y

12) Compute

$20 \div 4 + 3 \times 6 - 12 \div 4$

Lesson 4
Solving a System of Equation Algebraically – Addition Method Review

Classwork:

Which term (x or y) cancels to solve the problem? Cross out the variables that can cancel.
DO NOT SOLVE

1) $x + y = -6$
$x - y = 2$

2) $2x + y = 5$
$2x - y = 3$

3) $5x - 2y = 9$
$3x + 2y = 7$

4) $x + 4y = 5$
$-x + y = 2$

5) $2x + 3y = 6$
$-2x + y = 2$

6) $3x + 2y = 7$
$3x - 2y = 5$

7) $x + 3y = 0$
$2x - 3y = 9$

8) $-4x + 2y = 6$
$4x + 2y = 3$

Determine which term (x or y) you are going to cancel to solve the problem, and then show the next step.
DO NOT SOLVE

9) $3x - y = 8$
$x + 2y = -2$

10) $x - 5y = 2$
$2x + y = 4$

11) $4x - 2y = 10$
$3x + 4y = 4$

12) $x + y = 2$
$x - y = -6$

13) $5x - 2y = 1$
$-2x + 3y = 4$

14) $2x + 4y = 2$
$3x + 5y = 2$

15) $5x - 9y = -3$
$4x - 3y = 6$

16) $3x - 2y = -5$
$-4x - 3y = 8$

Lesson 4: Try These Solve the system for x and y:

1) $2x + y = 7$
$3x - y = 8$

2) $5x + 6y = 3$
$-5x - 2y = -11$

3) $5x - 2y = 9$
$3x + 2y = 7$

4) $2x + 3y = 6$
$-2x - y = -2$

5) $2x + y = 8$
$3x - 2y = 5$

6) $x + 3y = 16$
$2x - y = 4$

7) $2x - 3y = 6$
$x - 2y = 3$

8) $x + 2y = 4$
$3x - y = 5$

9) $5x - 2y = 1$
$-2x + 3y = 4$

10) $2x + 4y = 2$
$3x + 5y = 2$

11) $5x - 9y = -3$
$4x - 3y = 6$

12) $3x - 2y = -5$
$-4x + 3y = 8$

Lesson 4: Homework Solve the system for x and y:

1) $x + y = 9$
$x - y = 5$

2) $3x + 2y = 18$
$-3x + 6y = 30$

3) $-x - 6y = -10$
$x + 2y = 2$

4) $-4x + 2y = 10$
$-x - 2y = 0$

5) $5x + 4y = 7$
$3x + 2y = 3$

6) $5x - 2y = 14$
$3x + 4y = -2$

7) $x + y = 9$
$2x - 3y = 3$

8) $3x + y = 16$
$2x + y = 11$

---

9) $5x - 2y = 2$
$2x - 3y = 3$

10) $3x - 7y = 7$
$4x - 3y = 22$

---

11) $x + y = 9$
$3x - 4y = -1$

12) $3x - 2y = 15$
$7x - 3y = 15$

Lesson 5

Solving a System of Equation Algebraically – Substitution Method

Steps

1) If one equation is in the form of: x = or y =
2) Substitute the known variable
3) Solve the equation
4) Solve for other variable by substituting the known variable
5) Write the answer as a coordinate pair
6) Check the solution in both equations

Examples: Solve each system of equations algebraically.

1) $x + 5y = -8$
$x = 7$

2) $x + y = 4$
$y = x$

3) $2x + 3y = 22$
$x = 4y$

4) $4x + 3y = 27$
$y = 2x - 1$

Lesson 5 Classwork: Solve each system of equations algebraically.

1) $y - x = 8$
$x = 3$

2) $x + y = 10$
$y = x$

3) $x + y = 21$
$y = 2x$

.

4) $x + y = 9$
$y = x + 1$

Lesson 5 Homework: Solve each system of equations algebraically.

1) $x + y = 7$
$y = -3$

2) $3x + 4y = -10$
$x = -3y$

3) $x + y = 0$
$x - y = 6$

4) $x - 3y = -11$
$3x + y = 17$

Review Work:

5) Solve for x and identify the type of solution.

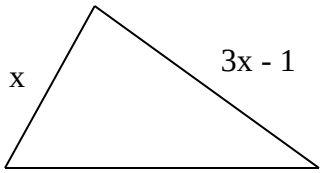
$$9x = 8 + 5x$$

Type of solution: _____

6) Which expression is equal to $\frac{13^{-11}}{13^{-12}}$

a) 13^{-23}
b) 13^{-1}
c) 13
d) 13^{132}

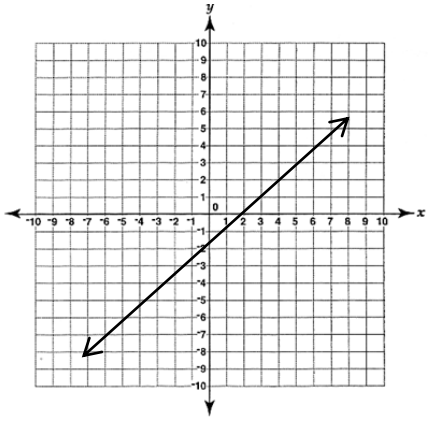
7) Express the perimeter in terms of x.



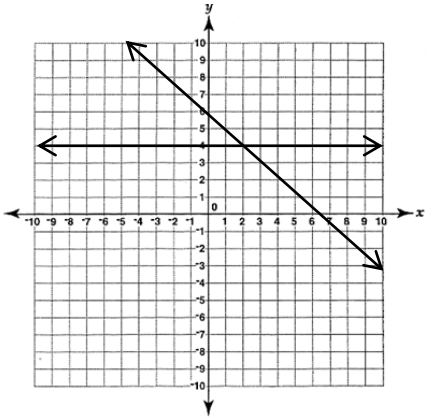
8) What is the slope of the equation?

$$6x + 2y = 12$$

9) What is the equation of the line?



10) What is the solution?



11) Find the function rule.

a	2	3	4	5	6	12
b	-2	-3	-4	-5	-6	

12) Compute:

a) $\frac{6}{0}$ = _____

b) $\frac{0}{6}$ = _____

c) 6^0 = _____

d) $6x^0$ = _____

Lesson 6

Solving a System of Equation Algebraically – Substitution Method (y = y)

Steps

1) Solve both equations for y
2) Since y = y set the equations equal to each other
3) Solve the equation
4) Solve for other variable by substituting the known variable
5) Write the answer as a coordinate pair
6) Check the solution in both equations

Examples: Solve each system of equations algebraically.

1) $y = -x + 8$
   $y = 3x$

2) $y = x + 4$
   $y = 2x + 5$

3) $y = -x + 7$
   $y = x - 1$

4) $x + y = 4$
   $x - y = 0$

Lesson 6 Classwork: Solve each system of equations algebraically.

1) $y = x + 5$
$y = -x + 11$

2) $y = -x - 1$
$y = 3x + 7$

3) $y = x + 1$
$y = -x + 3$

.

4) $y = -x$
$y = 3x - 4$

Lesson 6 Homework: Solve each system of equations algebraically.

1) $y = -3x + 2$
$y = 2x - 3$

2) $y = 2x + 6$
$y = -x - 3$

3) $y - x = 0$
$y + x = 10$

4) $y = 2x$
$y = -2x - 4$

Review Work:

5) Solve for x and identify the type of solution.

$2x - 4 = 2(x - 2)$

Type of solution: _____

6) Simplify

$4^{10} \cdot 4^{-7}$

7) Determine the slope of a line that contains the following points:

(0, 7) and (0, 1)

8) Write the equation of the line whose slope is -2 and y-intercept is 4.

9) True or false.

a) A straight line is a good model for a scatter plot that shows a nonlinear Association.

a) A trend line should always pass through at least 2 actual data points on a scatter plot.

10) Solve for x.

$4x - 6 = 2(x + 10)$

11) Find the area.

12) Write the following in expanded form.

$5^3 \cdot 6^2$

Lesson 7
Fractions and Decimals

Examples:

1) $x - 2y = 1$
$\frac{2}{3}x + 5y = 26$

2) $\frac{1}{3}x + \frac{1}{4}y = 10$
$\frac{1}{3}x - \frac{1}{2}y = 4$

3) $.04x + .06y = 26$
$x + y = 500$

4) $.03x - .06y = 9$
$x + y = 600$

Lesson 7: Classwork/Homework

1) $6x - y = 11$ $2x + 3y = 7$	2) $y = 2x + 5$ $y = 3x - 1$	3) $x - y = 6$ $y + x = 2$
4) $5x - y = 2$ $3x - 6y = 12$	5) $2x + y = 4$ $2x - y = 0$	6) $y = 2x + 3$ $y = 5x$
7) $3x - y = 4$ $3x + y = 2$	8) $2x + y = 2$ $x + 5y = 1$	9) $-6x + 5y = 25$ $-2x - 4y = 14$

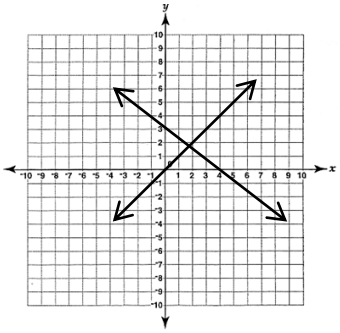
10) $-5x + 2y = 13$ $5x + y = -1$	11) $x + 2y = 7$ $x - 2y = -5$	12) $y = 2x - 1$ $y = x$
13) $y = -3$ $4y - 2x = 10$	14) $3x + 4y = -6$ $7x + 4y = -14$	15) $-3x - y = -11$ $6x + 3y = 24$
16) $5y = 15 - 5x$ $y = -2x + 3$	17) $y = -3x + 6$ $y = -3x + 2$	18) $2x - 6y = -6$ $7x - 8y = 5$

19) $2x = y - 10$ $x + 7 = y$	20) $x = y - 1$ $2y - x = 4$	21) $x - y = 4$ $x + y = -16$
22) $3x - 2y = 3$ $x = 2y + 7$	23) $2y = -8$ $x + 2y = -9$	24) $y - x = 0$ $3y - x = 14$
25) $\frac{1}{2}x + \frac{1}{3}y = 8$ $\frac{3}{2}x - \frac{4}{3}y = -4$	26) $2x = 3y$ $\frac{2}{3}x - \frac{1}{2}y = 2$	27) $.03x + .05y = 17$ $x + y = 400$

Lesson 8
Types of Solutions

Each system of equations can have three types of solutions:
1) One solution
2) No Solution
3) Infinitely many solutions

Review:
Tell how many solutions each graph has

1) 

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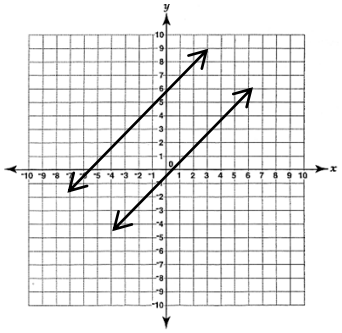
2) 

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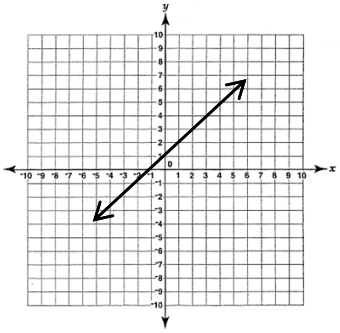
3) 

_____

Tell how many solutions each system has

4) $y = 2x + 7$
$y = 2x - 3$

_____

5) $y = -3x + 4$
$y = 2x + 1$

_____

6) $y = x + 3$
$2y = 2x + 6$

_____

Examples: Tell how many solutions each system has

1) $4x + y = 16$
$-4x - y = 5$

_____

2) $4x - 5y = 12$
$2x + 5y = 6$

_____

3) $2x - 3y = 12$
$-2x + 3y = -12$

_____

Rule:

How do you know how many solutions?

1) One Solution: _____

2) No Solution: _____

3) Infinitely Many Solutions: _____

Lesson 8: Classwork

Tell how many solutions each system has: One solution, No Solution, or Infinitely many solutions

1) $y = 3x - 7$
$y = 2x + 7$

_____

2) $y = 2x - 4$
$3y = 6x - 12$

_____

3) $y = x + 7$
$y = x + 6$

_____

4) $x + 5y = -20$
$-x - 5y = 20$

_____

5) $3x - 2y = 9$
$3x + 2y = -3$

_____

6) $6x - 4y = 28$
$-6x + 4y = 10$

_____

Types of Solutions: Homework

1) How many solutions are there to this system of equations? Explain how you know

$2x - y = 5$
$2x + y = 3$

_____
_____
_____
_____

2) What is the solution this system of equations? Show your work

$x - 5y = 1$
$2x - 7y = 8$

3) How many solutions does this system of linear equations have?

$-4x = 5y - 2$
$4x + 5y = 2$

4) Brayden and Dominic solved the system: $-3x + y = -5$
$6x - 2y = 10$

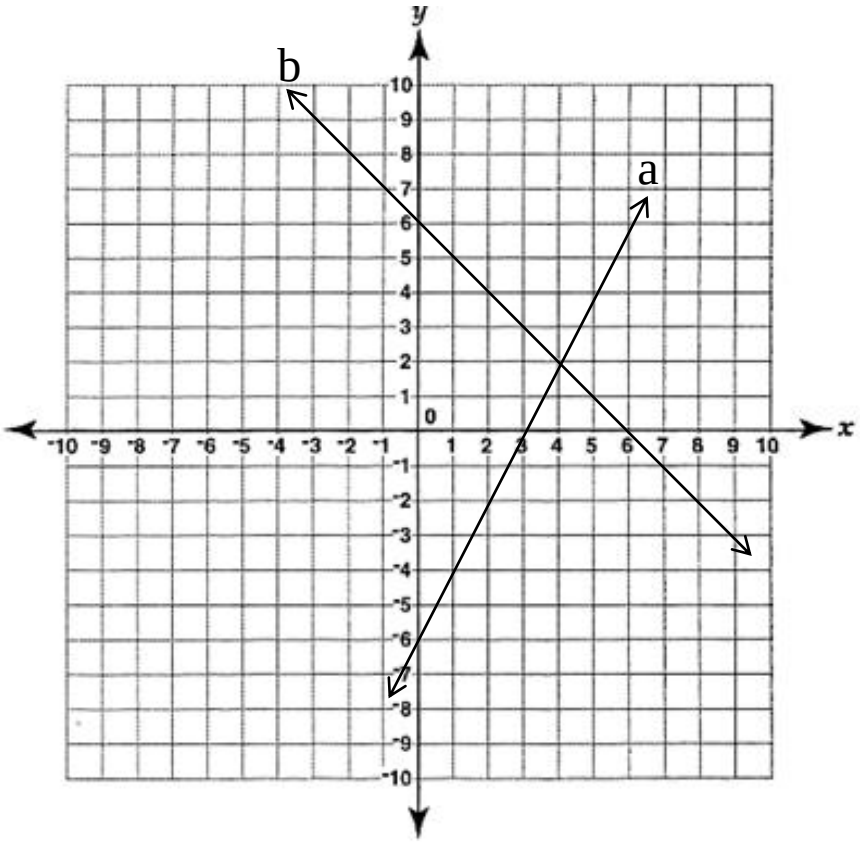
Part A: Is (2,1) a solution to this system? Explain how you know.

_____
_____

Part B: Brayden thinks there is only one solution to this system of equations. Dominic thinks there is more than one. Who is correct Brayden or Dominic? Explain how you know._____
_____

Lesson 9
Understanding Systems of Equations

Warm Up:



1) What is the equation of line a

2) Name two points on the line a

3) What is the equation of line b

4) Name two points on the line b

5) How many solutions are there?

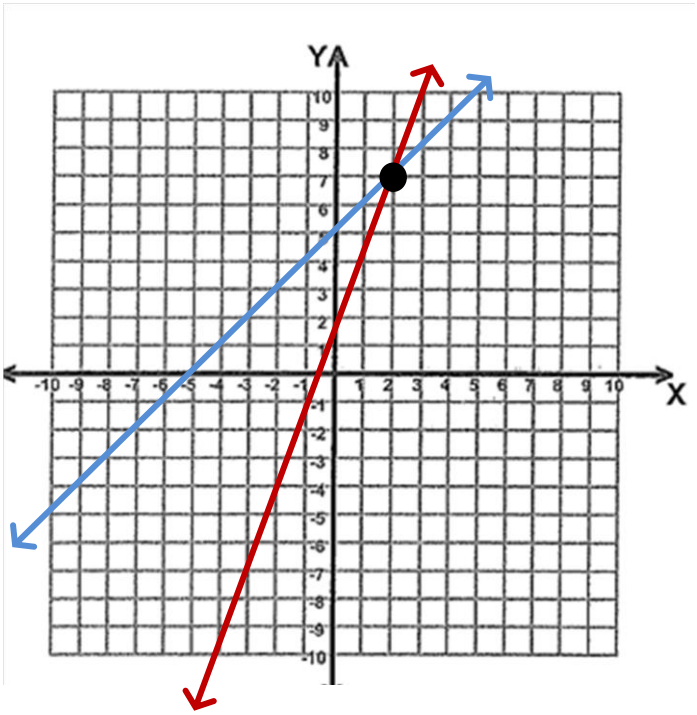
6) Name the ordered pair that is a solution of the two equations shown.

Examples:

x	y = 3x + 1	y
0	(1) = 3(0) + 1 1 = 0 + 1 1 = 1	1
1	(4) = 3(1) + 1 4 = 3 + 1 4 = 4	4
2	**(7) = 3(2) + 1** **7 = 6 + 1** **7 = 7**	**7**
3	(10) = 3(3) + 1 10 = 9 + 1 10 = 10	10

x	y = x + 5	y
0	(5) = (0) + 5 5 = 0 + 5 5 = 5	5
1	(6) = (1) + 5 6 = 1 + 5 6 = 6	6
2	**(7) = (2) + 5** **7 = 2 + 5** **7 = 7**	**7**
3	(8) = (3) + 5 8 = 3 + 5 8 = 8	8

- ➔ This is the only location (2,7) that works in each equation.
- ➔ The lines intersect at that point
- ➔ ALSO, when you plug 2 into x and 7 into y, the left side equals the right side in each.



Lesson 9: Classwork

1) How can we determine that the point (4, 3) is a solution to the lines $x + y = 7$ and $x – y = 1$?

_____

_____

2) What is the solution to this system of equations? $x + y = 4$

$x – y = -2$

3) Is the point (1,3) the solution to the lines $2x + y = 10$ and $y = -2x + 5$? Justify your answer.

4) What do you think the graph of the lines in question # 3 looks like?

5) What do you think the algebraic solution to question # 3 look like?

6) Complete the table and determine the solution to the system?

x	y = 3x - 1	y
1		
2		
3		
4		

x	y = 2x + 1	y
1		
2		
3		
4		

7) A classmate uses the system of equation below to conclude that (2,5) is a solution because $(3 \cdot 2) + (2 \cdot 5) = 16$. Explain why she is **incorrect.**

$3x + 2y = 16$

$-xy + 5 = 15$

_____

_____

_____

8) What does it mean when a system of equations overlap on a coordinate plane?

_____

_____

_____

9) When a given system of equations is solved algebraically the solution is 8 = 8. What do you think that this solution represents?

_____

_____

_____

10) When a given system of equations is solved algebraically, the solution is 5 = 7. What do you think that this solution represents?

_____

_____

Review Work:

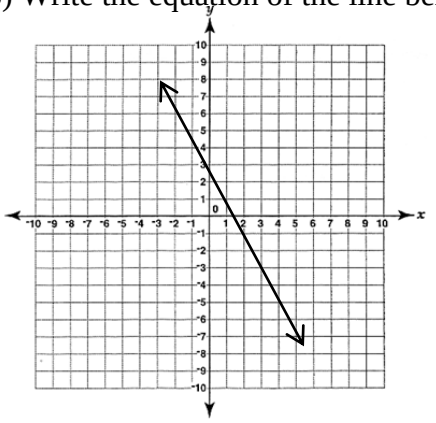
11) Solve for x:

$4.5(x - 2) + 1.5x = 2(3x - 4) - 1$

12) In words, explain how you know that $(x^6)^2$ is equal to x^{12}.

_____
_____
_____
_____
_____
_____

13) Write the equation of the line below



m =

b =

14) What is the slope of the line y = 2

15) Compare using < > or =

6^2 ◯ 2^6

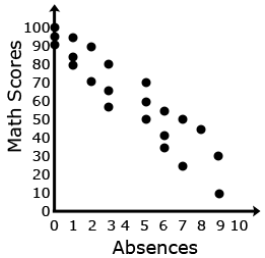
16) Simplify

$24 \div 2 \cdot 4 + 3^2$

17) Solve for y.

$4 - 2y = 16$

18) Explain whether the scatter plot shows a positive, negative, or no association.



Lesson 10
Translating Expressions

x + 5	**x – 5**	**5x**	**$\frac{5}{x}$**
x plus 5 the sum of x and 5 x increased by 5 **5 more than x** **5 added to x**	x minus 5 the difference of x and 5 x decreased by 5 **5 less than x** **5 subtracted from x**	5 times x the product of 5 and x 5 multiplied by x	5 divided by x The quotient of 5 and x

Try These: Matching

___ 1) n increased by 11
___ 2) 11 less than n
___ 3) the sum of n and 19
___ 4) 11 more than n
___ 5) n increased by 19

A) n – 19
B) n + 11
C) n + 19
D) n – 11
E) 19 – n
F) 11 – n

Classwork: Write each as an algebraic expression

_____ 1) m increased by 8
_____ 2) 4 less than c
_____ 3) the sum of b and 14
_____ 4) 7 decreased by k
_____ 5) 3 more than twice d
_____ 6) 17 increased by 5 times r
_____ 7) 4 less than 6 times w
_____ 8) 8 increased by 7 times a number
_____ 9) twice Don's age increased by 8
_____ 10) 40 more than Meg's bowling score
_____ 11) the sum of 32 and twice a number
_____ 12) Abe's savings decreased by $540
_____ 13) 24 decreased by 4 times a number
_____ 14) Tom's batting average increased by 12
_____ 15) 8 times a number, decreased by 14
_____ 16) the product of x and y
_____ 17) 11 more than x times y
_____ 18) the quotient of x and 8
_____ 19) the difference of x and 7
_____ 20) 3 less than 4 times a number, increased by 7

Lesson 10
Word Problems

Steps	Vocabulary
1) Write a Let statement to define what x and y stand for. 2) Write 2 equations in the form of x + y = # 3) Solve the equation for 1 variable 4) Solve for other variable by substituting the known variable 5) Write the answer in the Let Statement 6) Check the solution in both equations	Let Statement System of Equations Algebraic solution

Examples: Solve each problem algebraically.

Problem	Solution
1) Paul, the magician is thinking of two numbers. The sum of two numbers is 36. Their difference is 24. Find the numbers. Let x = y =	
2) The sum of two numbers is 18. Two times the larger plus 3 times the smaller equals 27. Find the numbers	
3) A warehouse stacks 3 large boxes and 2 small boxes to a height of 11 feet. It also stacks 2 large boxes and 1 small box to a height of 7 feet. What are the heights of a large and small box?	
4) At a store, 3 notebooks and 2 pencils cost $2.80. At the same prices, 2 notebooks and 5 pencils cost $2.60. Find the cost of one notebook and one pencil.	

Try These: Solve each problem algebraically.

Problem	Solution
1) The sum of two numbers is 12. Their difference is 4. Find the numbers. Let x = y =	
2) The sum of two numbers is 11. Three times the larger minus 2 times the smaller equals 8. Find the numbers.	
3) Kiana and Jacob each have a collection of identical red and blue marbles. Kiana's collection of 12 red marbles and 8 blue marbles weighs 70 grams. Jacob's collection of 20 red marbles and 12 blue marbles weighs 110 grams. How much does each color marble weigh?	
4) At the cafeteria 3 pretzels and 1 soda costs $2.75. Two pretzels and 1 soda costs $2.00. Find the cost of a pretzel and a soda.	

Review:

5) Multiply: $(3x^4)(2x^2 - 1)$	6) Determine the slope. $-y = 9 + 3x$
7) How many solutions would this system have? $-7 = -7$	8) Simplify the expression. $(3x^2 + 5x - 8) - (6x^2 - x - 2)$

Lesson 10: Classwork

Write a Let Statement and Set up 2 equations (Do not solve)

1) The sum of two numbers is 36. Their difference is 24. Find the numbers.

2) The sum of two numbers is 10. Three times the larger decreased by twice the smaller is 15. Find the numbers.

3) The owner of a men's clothing store bought 6 belts and 8 hats for $140. A week later, at the same prices, he bought 9 belts and 8 hats for $132. Find the price of a belt and a hat.

4) At King Kullen 3 pounds of squash and 2 pounds of eggplant cost $2.85. The cost of 4 pounds of squash and 5 pounds of eggplant is $5.41. What is the cost of 1 pound of squash?

*5) The sum of two numbers is 77. The larger number is 3 more than the smaller number. Find the numbers.

*6) A health food store mixes granola that costs them $4 per pound and raisins that cost them $2 per pound together to make 25 pounds of mixed raisin granola. How many pounds of raisins should they include if they want the mixture to cost them a total of $80?

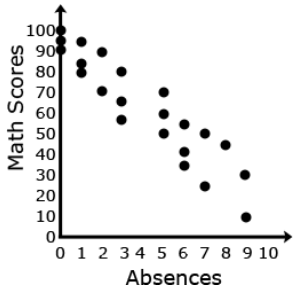
Lesson 10: Homework

Solve questions 1-4 algebraically.

1) The sum of two numbers is 47, and their difference is 15. What is the larger number?	1)
2) The cost of 3 markers and 2 pencils is $1.80. The cost of 4 markers and 6 pencils is $2.90. What is the cost of *each* item? Include appropriate units in your answer.	2)
3) Jack bought 3 slices of cheese pizza and 4 slices of mushroom pizza for a total cost of $12.50. Grace bought 3 slices of cheese pizza and 2 slices of mushroom pizza for a total cost of $8.50. What is the cost of one slice of mushroom pizza?	3)
**4) The sum of two numbers is 77. The larger is 3 more than the smaller number. Find the numbers.	4)

Review Work:

5) Draw the line of best fit.



6) Solve for x: $\frac{1}{2}(x - 6) + 1 = 2(x - 10) - 3$

7) Simplify.

$$\frac{x^4y}{x^{14}y^8}$$

8) Find the function rule.

x	y
0	8
1	11
2	14
3	17

9) Determine whether the set of ordered pairs represents a function.

$\langle (0,0), (2,1), (4,2), (6,3) \rangle$

10) Put in order from least to greatest:

10^7 10^2 10^{-5} 10^{-7}

11) Evaluate when **x = -2** and **y = -4**

$-2x + 3y^2$

12) Fill in the blanks.

If data in a scatter plot form a straight band, the plot shows _____ association.

If data in a scatter plot are randomly scattered, the plot shows _____ association.

Name_____ Math 8 Unit 7 Review

Solve each system of equations algebraically and check.

1) $-x + 6y = -12$
$x + 4y = 2$

2) $5x + 3y = 15$
$3x - 3y = 9$

3) $5x + 2y = 3$
$3x + 2y = 5$

---

4) $4x + 2y = 12$
$2x + 4y = -18$

5) $6x + 9y = 57$
$x = 5$

6) $y = 5x + 4$
$y = 3x - 6$

---

7) $3x + 7y = -2$
$2x + 3y = -3$

8) $x - 4y = 3$
$-4x + 2y = 16$

How many solutions does each system have? (One Solution, Infinitely Many, or No Solution)

9) $x + 3y = -10$
$-x - 3y = 10$

10) $3x - 8y = 9$
$3x + 8y = -3$

11) $7x - 6y = 4$
$-7x + 6y = -5$

---

12) $-2x + y = 4$
$-8x + 2y = 16$

13) $-3x + 3y = 12$
$x - y = -4$

14) $x + y = 0$
$-5x - 5y = 12$

Translate the following expressions:

15) 5 less than 4 times x

16) Twice Tara's age increased by 10

17) 3 decreased by 6 times a number

18) 9 less than 5 times a number, increased by 1

19) 4 times the sum of b and k

Solve each problem algebraically:

20) A storage house stacks 2 large boxes and 1 small box to a height of 13 feet. It also stacks 3 large boxes and 1 small box to a height of 18 feet. What are the heights of a large and small box?

---

21) The sum of two numbers is 20. Their difference is 12. Find the numbers.

22) Sean bought 3 candy bars and 4 packs of gum for $12.50. Harry bought 3 candy bars and 2 packs of gum for $8.50. What is the cost of one pack of gum?

Unit 6:

23) Circle the equations that represent a direct proportion:

a) $y = 3x + 4$ b) $y = x$ c) $y = ½ x$ d) $y = x^2$ e) $y = -2x – 8$ f) $y = \frac{1}{3}x$

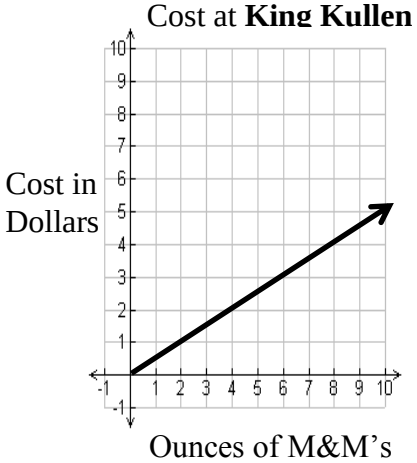
---

24) Stop and Shop and King Kullen both sell bags of M&Ms. Use the graph and the table to determine **which store is a better buy for M&M's?**

Cost at **Stop and Shop**

Ounces of M&M's	Cost of M&M's
5	$2
10	$4
15	$6
20	$8

Cost at **King Kullen**



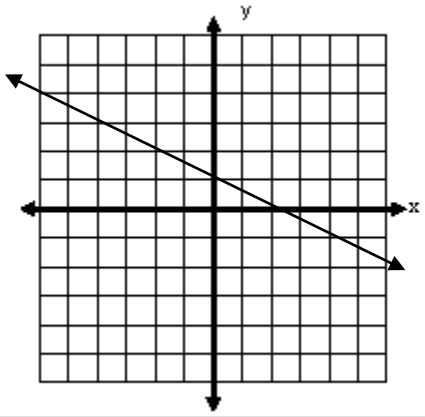
Unit 5:

Write the equation of a line given the following information.

25) b = 3, m = -4 26) slope = 1/2, y-intercept = 0 27) m = -8, b = -1 28) y-intercept = 4, slope = 4

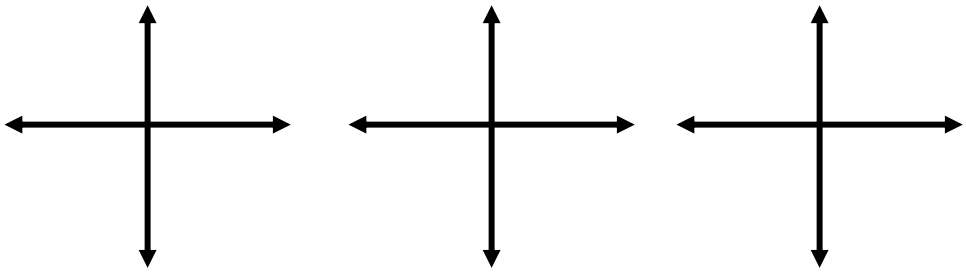
29) In Questions 25-28, which equation had the **greatest rate of change**?

30) What is the slope of the line



31) Draw 2 lines representing the following number of solutions:

a) No Solutions b) One Solution c) Infinite Solutions



Linear or Non-linear?

32) $y = x^2 + 4$ 33) $y = -8x + 2$ 34) Susan makes $3 per bracelet she sells.

Unit 4:

Solve for y and write the equation in y = mx + b form:

35) 3x + y = 7 36) -x + y = -6 37) 5y = 25x + 10

38) Write the equation of the line:

x	y
5	8
6	9
8	11
10	13

39) Write the equation of the line:

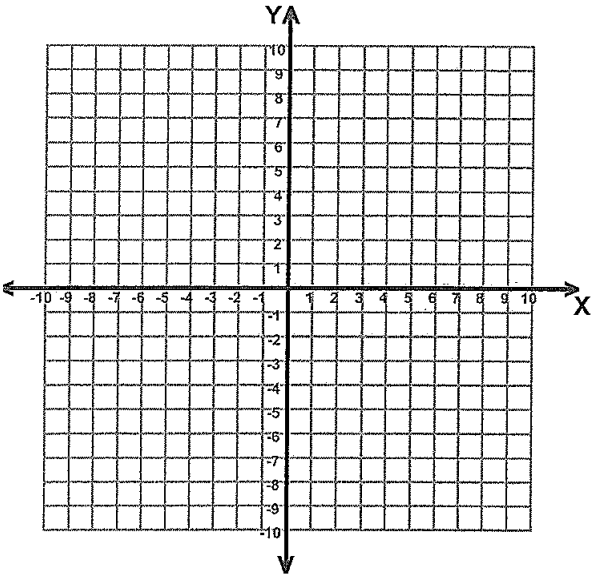
x	4	5	6	7	8
y	5	7	9	11	13

40) a) Graph the system of equations:

y = x y = -2x + 6

b) What is the solution?_____

c) Check the solution:



Unit 3: Simplify. Rewrite using all positive exponents.

41) $(3x^3)(-8x)$ 42) $(8^2)(8^{-5})(8)(8^{-7})$ 43) $\frac{16x^9y^7}{2x^5y}$ 44) $(-5x^4)^3$

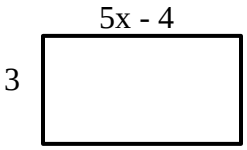
Unit 2: Solve for x. State the type of solution (one, no solution, infinite).

45) $4(x - 2) = 3x + 5$ 46) $0.75x + 1 = 0.75x + 1$ 47) $3x - 3 = 3x + 3$

Unit 1:

48) Simplify $18 - 4 \times 5 - 5^3$ 49) Convert 68°F into Celsius using the formula $C = \frac{5}{9}(F - 32)$.

50) a) Find the area. b) Find the perimeter.



Extra Help:

1) $5x - y = 10$
   $4x + y = 8$

2) $4x + 6y = 10$
   $4x + y = 25$

---

3) $2x + 3y = 24$
   $y = 2x$

4) $3x - 7y = 7$
   $4x - 3y = 22$

---

5) Tom and Ryan each have a collection of identical red and blue marbles. Tom's collection of 5 red marbles and 3 blue marbles weighs 19 grams. Ryan's collection of 2 red marbles and 1 blue marble weighs 7 grams. How much does each color weigh?

---

6) At Stop and Shop 1 pound of potato salad and 3 pounds of macaroni salad cost $10. The cost of 3 pounds of potato salad and 1 pound of macaroni salad is $6. What is the cost of 1 pound of potato salad?