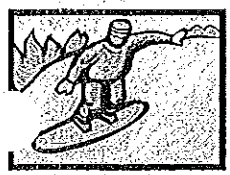


Slope

In this unit, you will:

- Define slope and describe a line
- Determine the slope and the y – intercept of a line given a graph
- Find the slope of a line using a formula
- Graph equations using slope-intercept form ($y = mx + b$)
- Write the equation of a line given:
  - The slope and y-intercept
  - A graph
  - A table of values
  - The slope and a point that lies on the line
  - From standard form
- Solve systems of linear equations graphically
- Solve systems of linear equations algebraically

Objective:

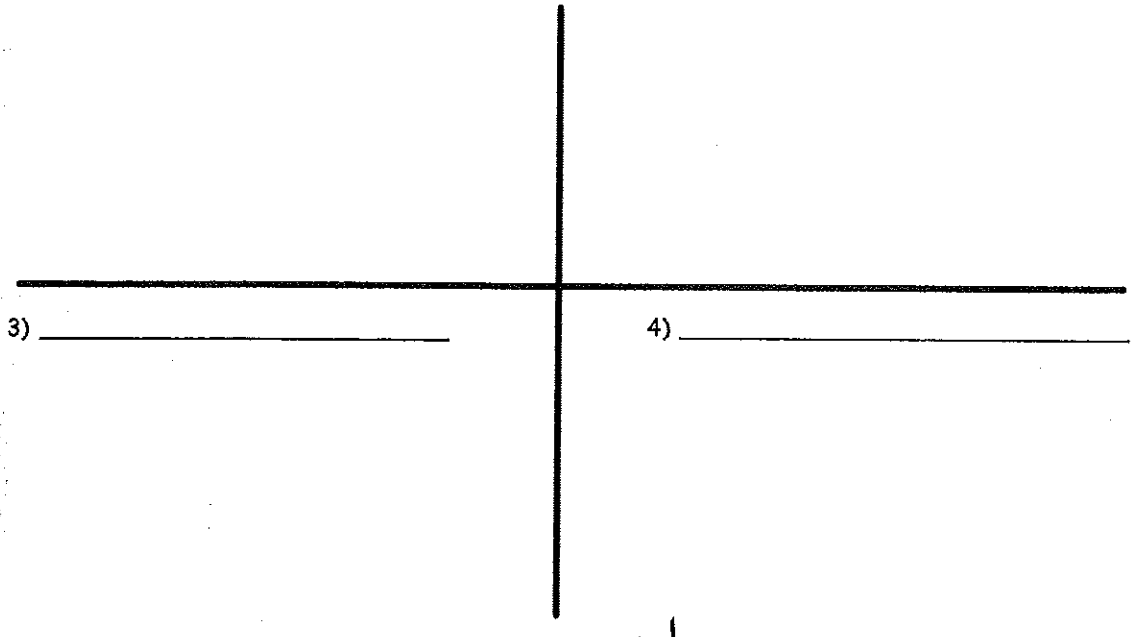
I will be able to:

- Define Slope
- Describe a line with the type of slope

Slope: _____

Four Types of Slope: Write the name and sketch the example:

1) _____ 2) _____



3) _____ 4) _____

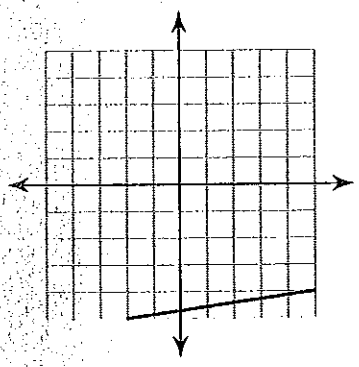
Slope Unit

Name_____

Describe the Slope

dentify the type of slope shown in each graph: positive, negative, zero, or undefined

1)



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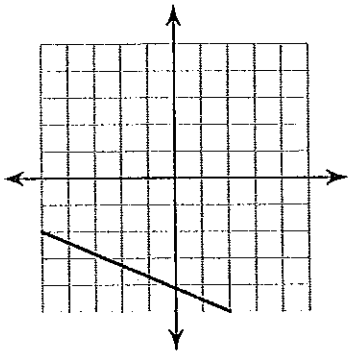

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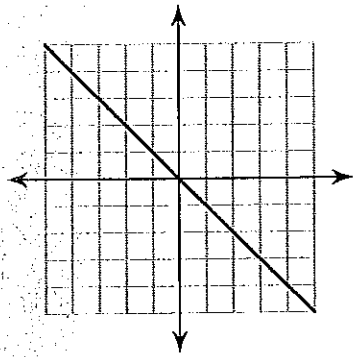

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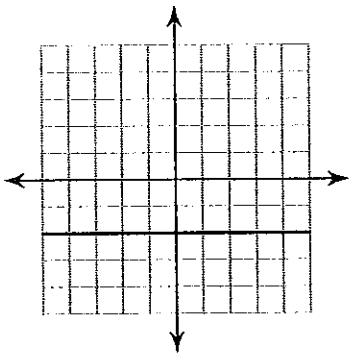

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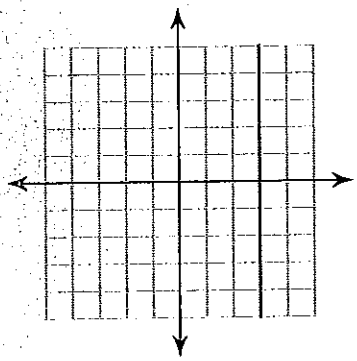

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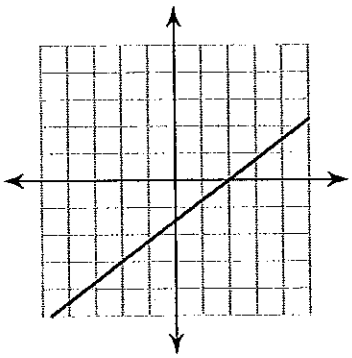

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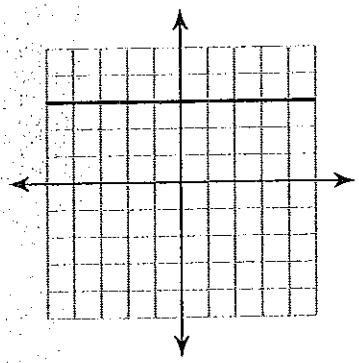

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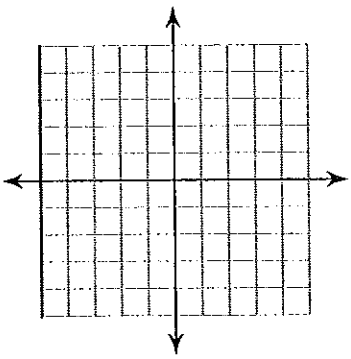

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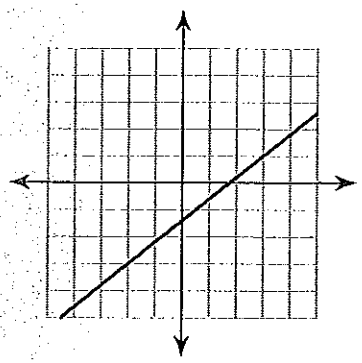

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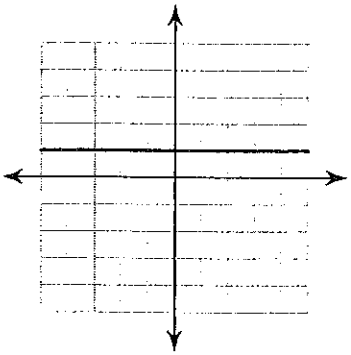

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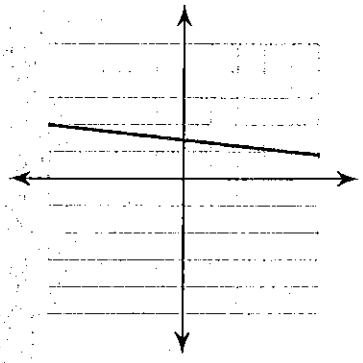

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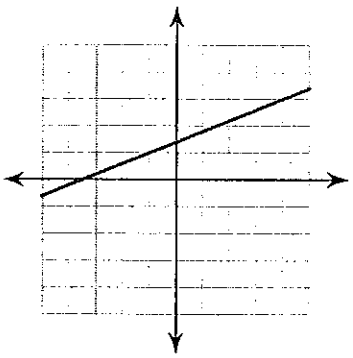

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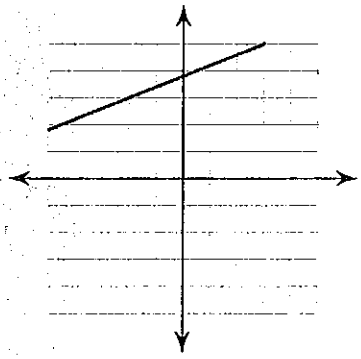

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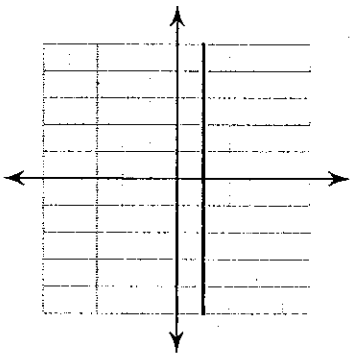

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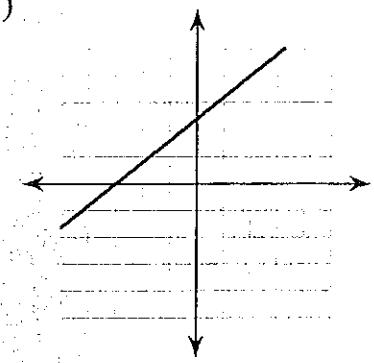


Objectives:

- I will be able to _____the slope given a graph.

To find slope when you have a graph, you can count between the points!

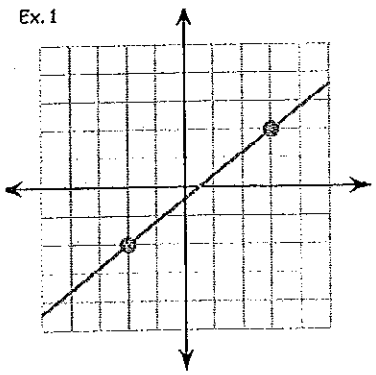
- Look at the type of slope the graph shows so you are aware of what your answer should be.
- Start from the first point given to you (the one furthest to the LEFT).
- Find the RISE: count up or down (y) until you get to the grid line even with the next point. (If you go up, it's positive, and if you go down, it is negative)
- Find the RUN: count over to the right (x) until you hit the point.
- Divide if it will give you an integer (come out even).
- If it doesn't, leave it as a fraction, but reduce to lowest terms- don't change it to a decimal.

Slope:

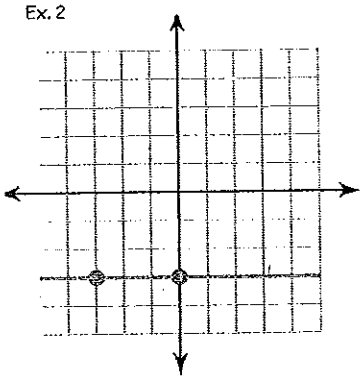
Constant rate of change:

$$\frac{\text{change in } y}{\text{change in } x}$$

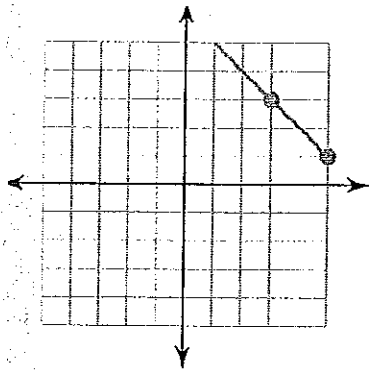
Ex. 1



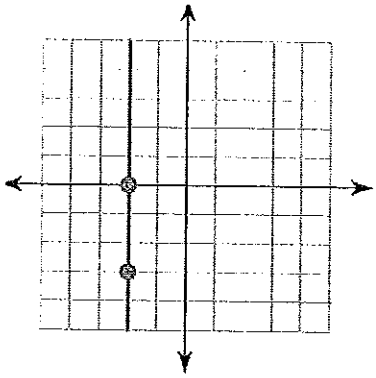
Ex. 2



Ex. 3



Ex. 4



Remember:

An increasing line has a _____ slope.

A decreasing line has a _____ slope.

A horizontal line has _____ slope.

A vertical line has _____ slope.

Math 8

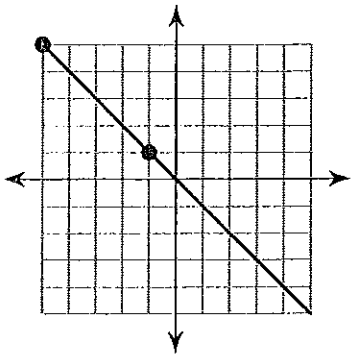
Name_____

Finding Slope from a Graph

Date_____

Find the slope of each line.

1)



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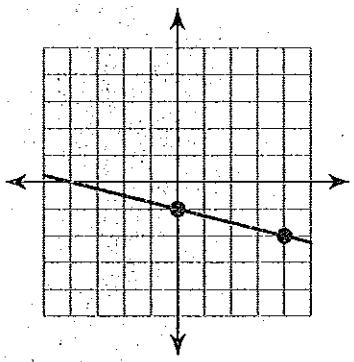
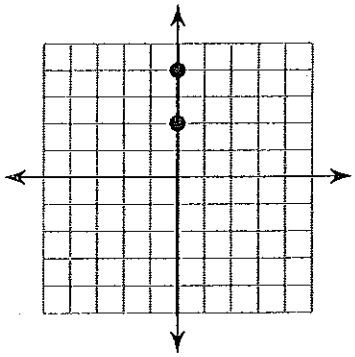


3)



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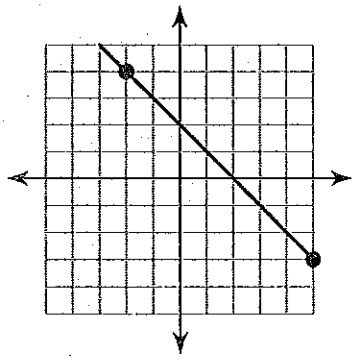
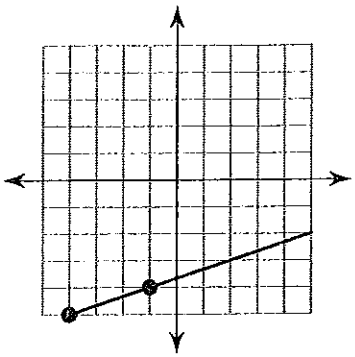


5)



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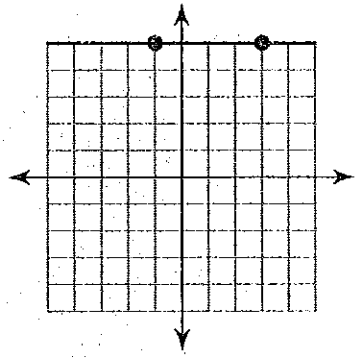

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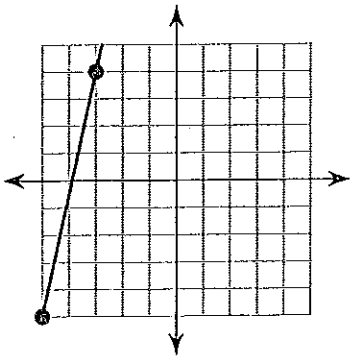
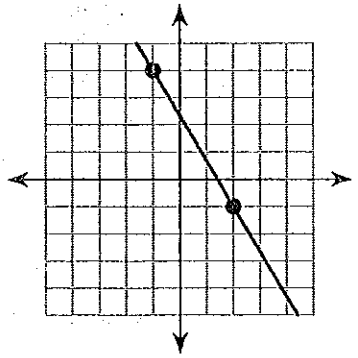


8)



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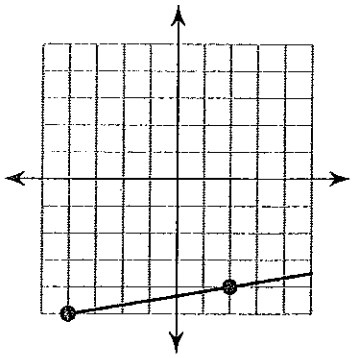

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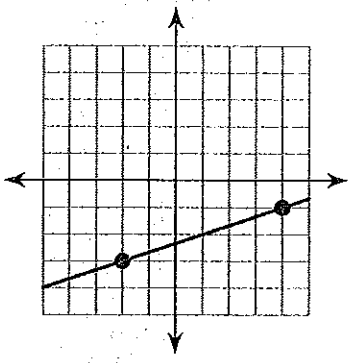

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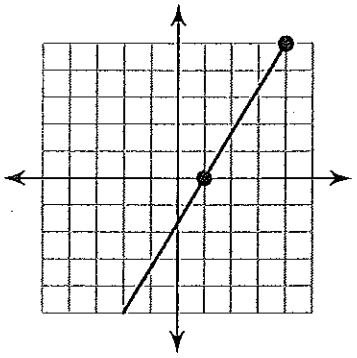

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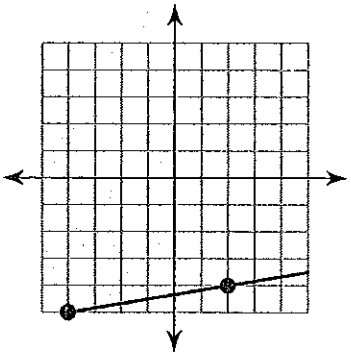

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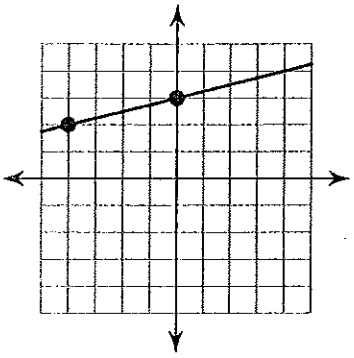

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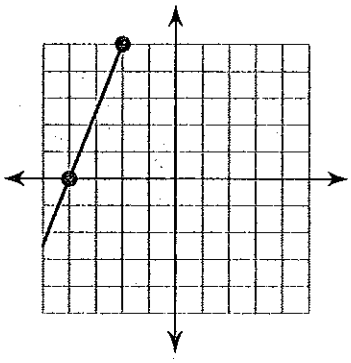

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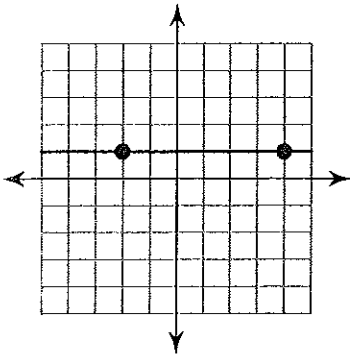

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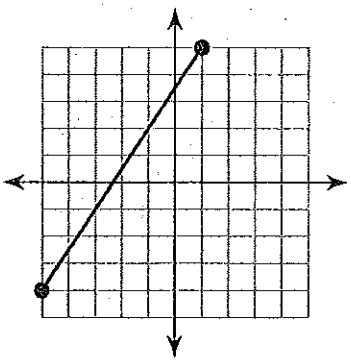

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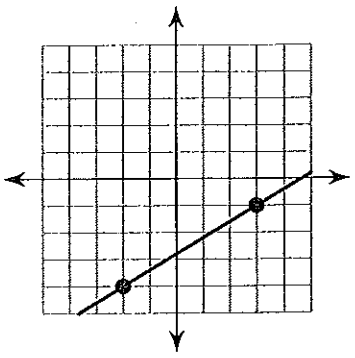

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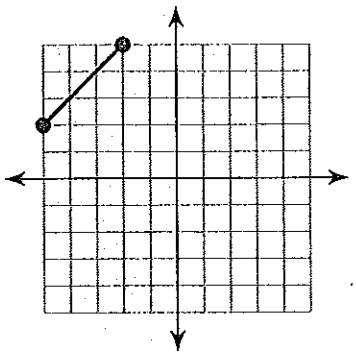

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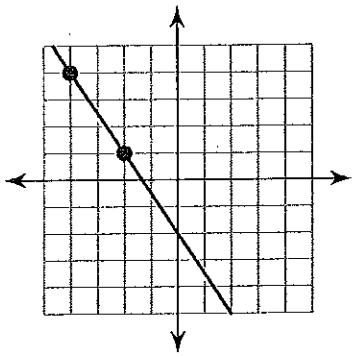

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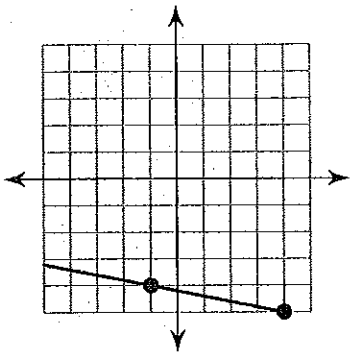

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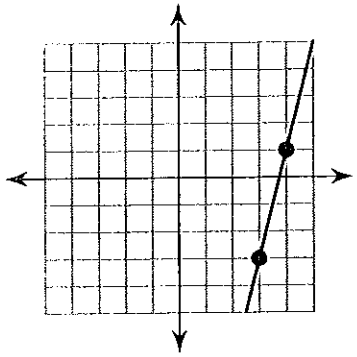

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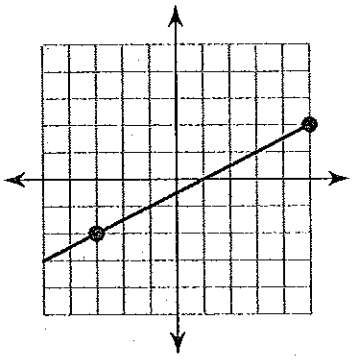

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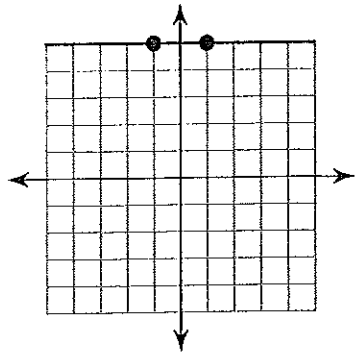

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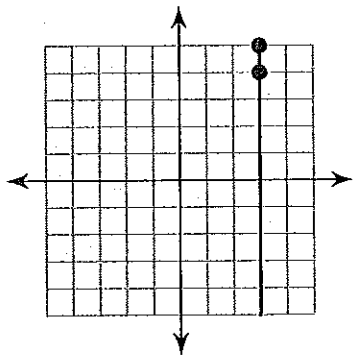


Objective:

I will be able to find the _____ of a line using a _____.

- When you don't have a graph to look at, you have to calculate the slope using the *slope formula*:
- *Slope Formula* = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{RISE}}{\text{RUN}}$

Example 1:

(2,4) and (5,7)

1. Label the coordinates for yourself.
2. Subtract the y coordinates. This is the change in y, or the _____
3. Subtract the x coordinates. This is the change in x, or the _____
4. Divide*

*No decimals in slope. We use fractions in lowest terms. Reduce your fractions.

Example 2: (-3,6) and (2,4)

Example 3: (-7,8) and (-7,6)

Example 4: (-5,3) and (1, -1)

Example 5: (-1,3) and (5,3)

Example 6: (3,9) and (1,5)

Example 7: (0,4) and (3, -2)

Name _____ Date _____ Class _____ 29

LESSON 5-3

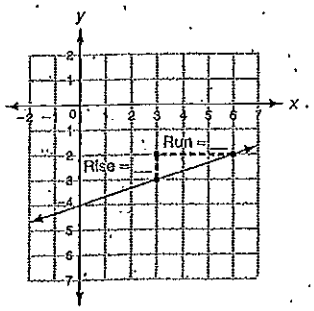
Practice A

Rate of Change and Slope

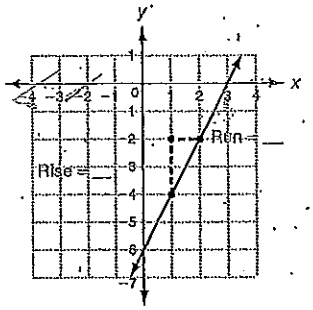
Fill in the blanks to define slope.

1. The _____ is the difference in the y-values of two points on a line.
2. The _____ is the difference in the x-values of two points on a line.
3. The slope of a line is the ratio of _____ to _____ for any two points on the line.

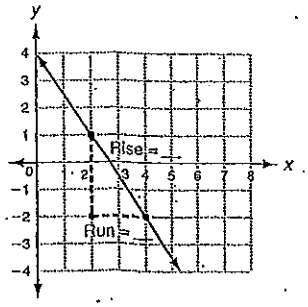
Find the rise and run between each set of points. Then, write the slope of the line.

4. 

slope = _____

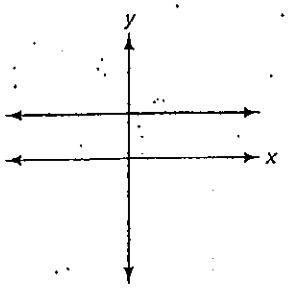
5. 

slope = _____

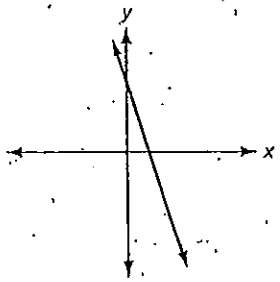
6. 

slope = _____

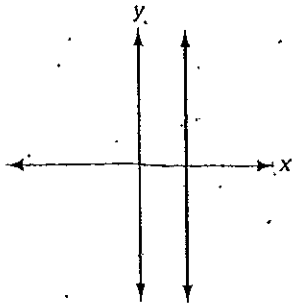
Tell whether the slope of each line is positive, negative, zero, or undefined.

7. 

_____

8. 

_____

9. 

_____

10. The table shows a truck driver's distance from home during one day's deliveries. Find the rate of change for each time interval.

Time (h)	0	1	4	5	8	10
Distance (mi)	0	35	71	82	199	200

Hour 0 to Hour 1: _____ Hour 1 to Hour 4: _____ Hour 4 to Hour 5: _____

Hour 5 to Hour 8: _____ Hour 8 to Hour 10: _____

The rate of change represents the average speed. During which time interval was the driver's average speed the least? _____

Name _____ Date _____ Class _____

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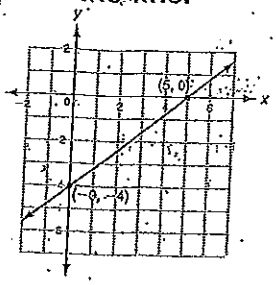
LESSON 5-3

Practice B

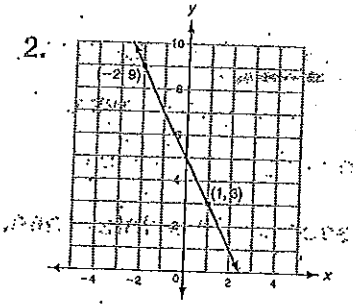
Rate of Change and Slope

Find the rise and run between each set of points. Then, write the slope of the line.

1. 

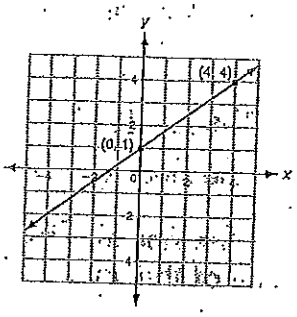
rise = _____ run = _____

slope = _____

2. 

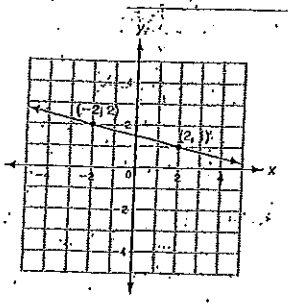
rise = _____ run = _____

slope = _____

3. 

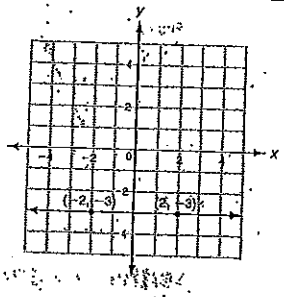
rise = _____ run = _____

slope = _____

4. 

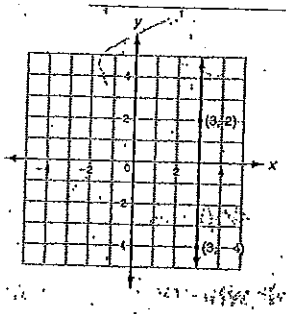
rise = _____ run = _____

slope = _____

5. 

rise = _____ run = _____

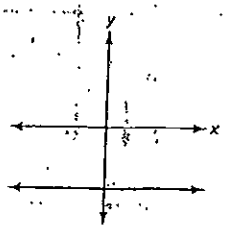
slope = _____

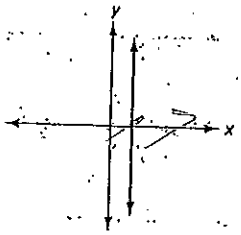
6. 

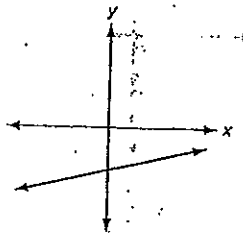
rise = _____ run = _____

slope = _____

Tell whether the slope of each line is positive, negative, zero, or undefined.

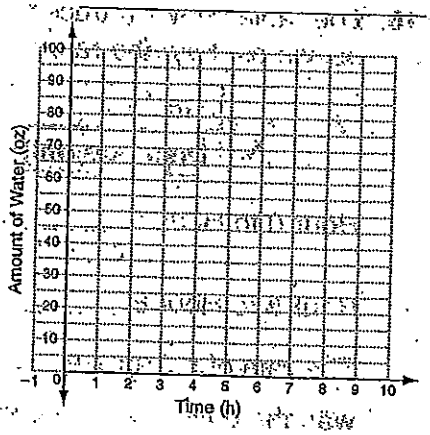
7. 

8. 

9. 

10. The table shows the amount of water in a pitcher at different times. Graph the data and show the rates of change. Between which two hours is the rate of change the greatest?

Time (h)	0	1	2	3	4	5	6	7
Amount (oz)	60	50	25	80	65	65	65	50



Math 8 Name:

Find the slope of the line that passes through each pair of points. Use Slope Formula. Show work as in ie notes.

1. (4,2) and (6,8)

2. (-3,-1) and (-5, -11)

3. (3,-3) and (0, 9)

4. (-8, 12) and (0, -12)

5. (8,3) and (14,5)

6. (-7,-5) and (5,4)

7. (-11, -4) and (-3,6)

8. (4,2) and (13,-4)

9. (-18, 5) and (4,5)

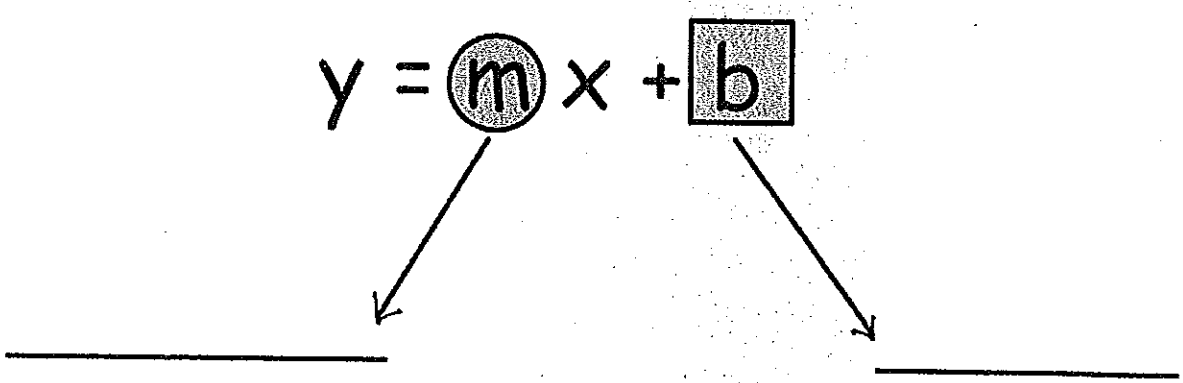
10. (6,-2) and (-9,-2)

11. (7, -15) and (7, 3)

12. (-4,9) and (-4,-6)

Objective: I will be able to _____ a line using $y = mx + b$ format.

SLOPE-INTERCEPT FORMAT: the equation gives you what you need...no more tables!

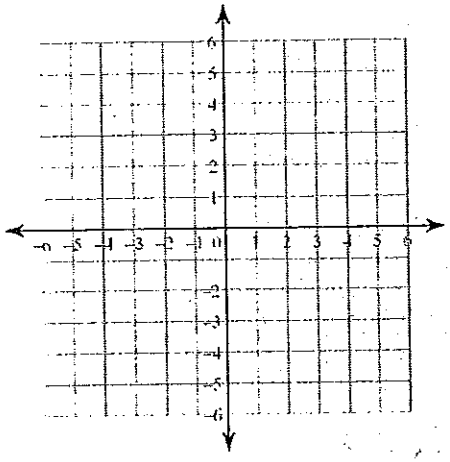


Equation:	Slope: "Rise" / "Run"	y-intercept
$y = 4x - 3$		
$y = -x + 4$		
$y = 2$		
$y = 1/2x + 3$		
$y = 3/5x$		

To graph:

- Plot the y-intercept onto the y-axis
- Use the slope to count RISE over RUN from the y-intercept to plot your next point
- Continue counting RISE over RUN from the plotted point to generate points to connect for the line.

$y = -x - 2$

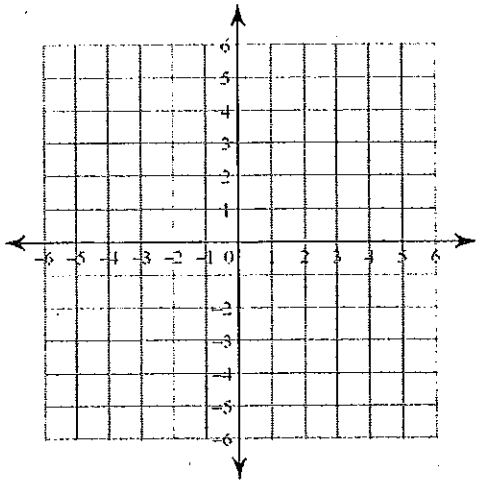


Ex. 1

Slope:

y-intercept:

$y = 4$

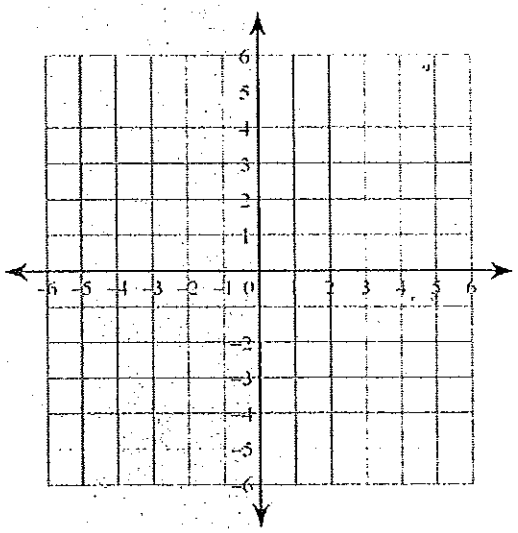


Ex. 2

Slope:

y-intercept:

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

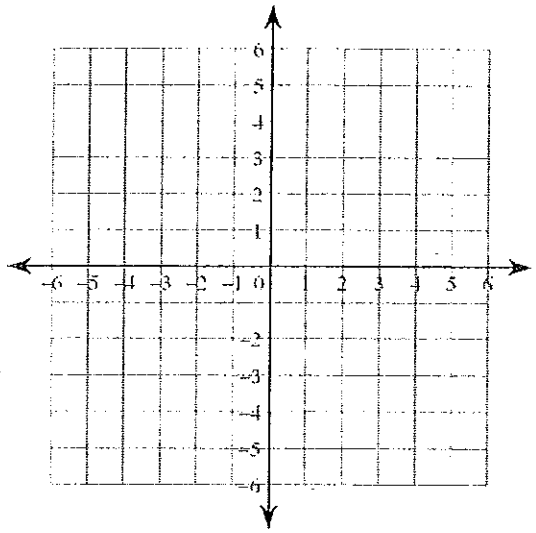


Ex. 3

Slope:

y-intercept:

$y = 2x - 5$

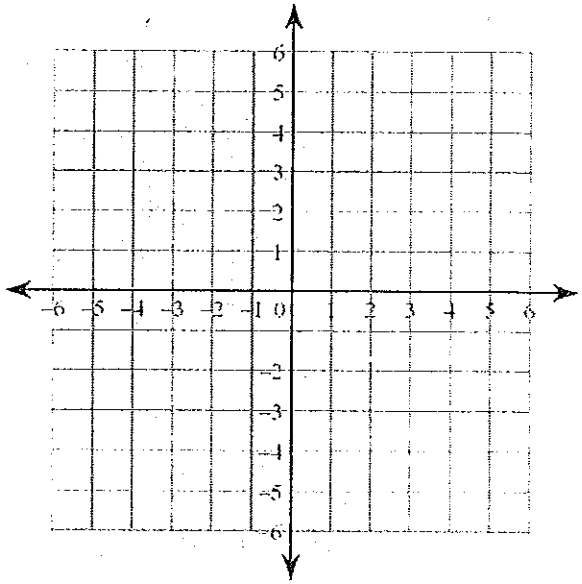


Ex. 4:

Slope:

y-intercept:

$y = -4x + 3$



Ex. 5

Slope:

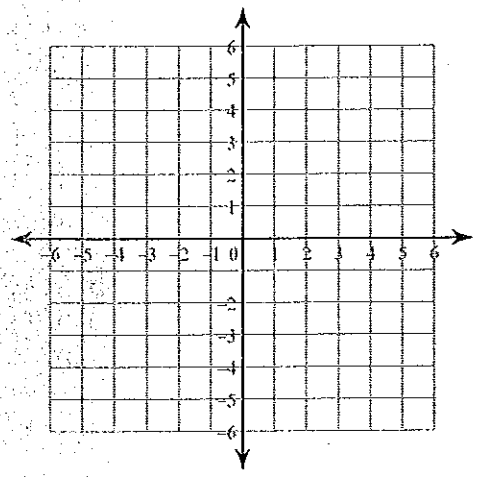
y-intercept:

Math 8 Name_____

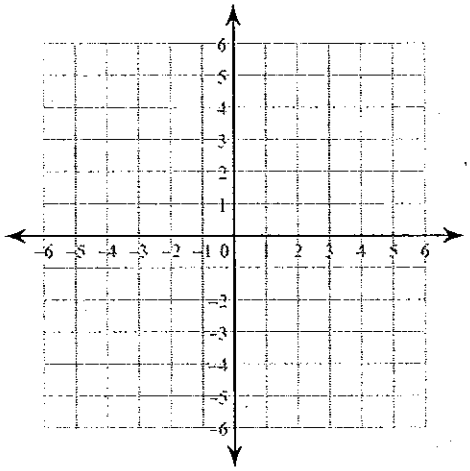
Graphing Lines in Slope-Intercept (y = mx +b) Form

Sketch the graph of each line.

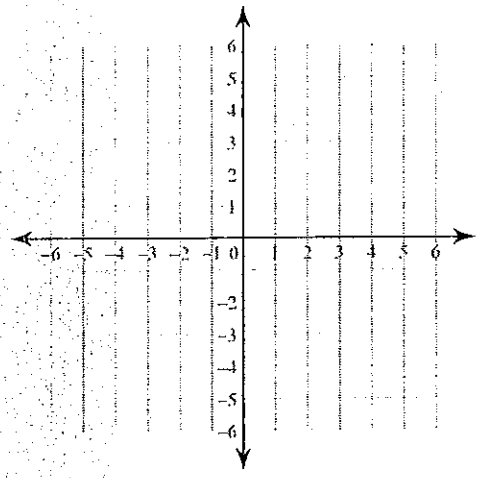
1) $y = -2x + 4$



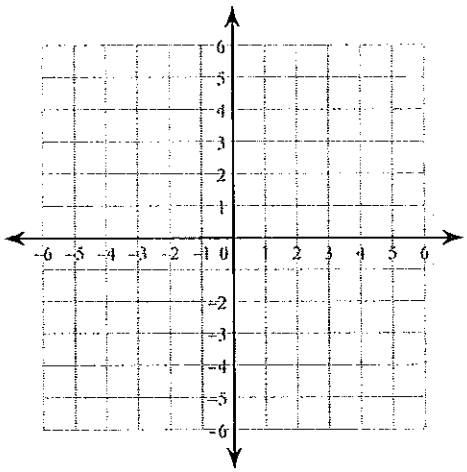
2) $y = \frac{1}{2}x + 1$



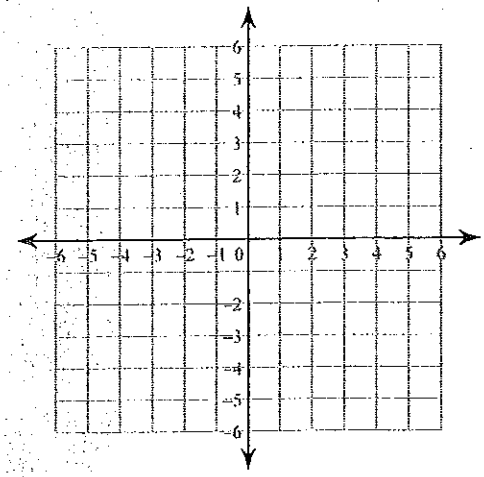
3) $y = \frac{1}{3}x + 2$



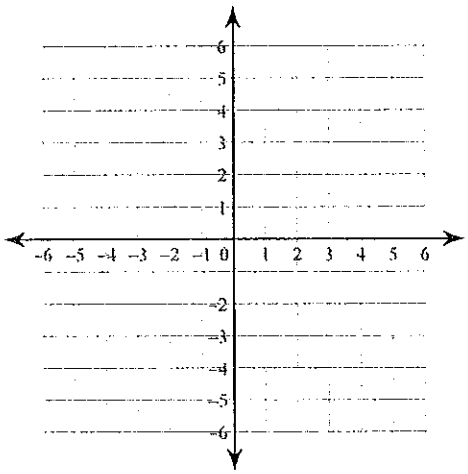
4) $y = 6x - 1$



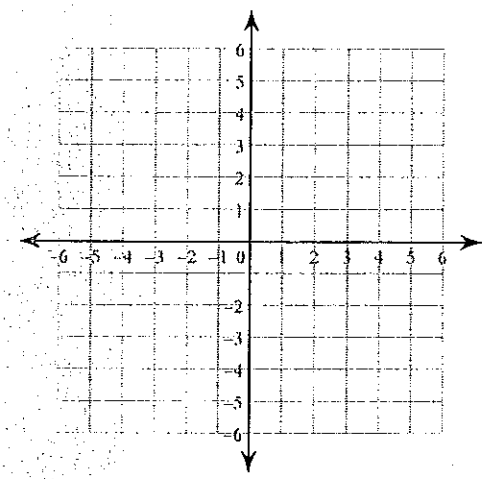
5) $y = -x - 1$



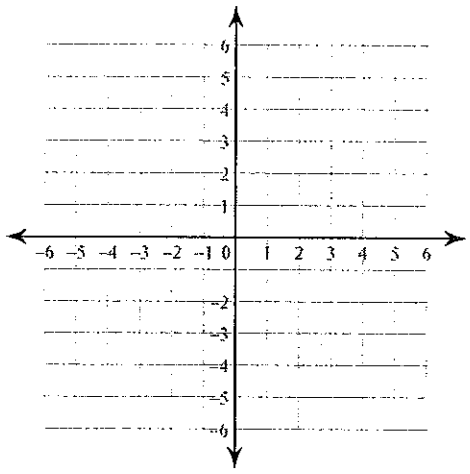
6) $y = -2x + 1$



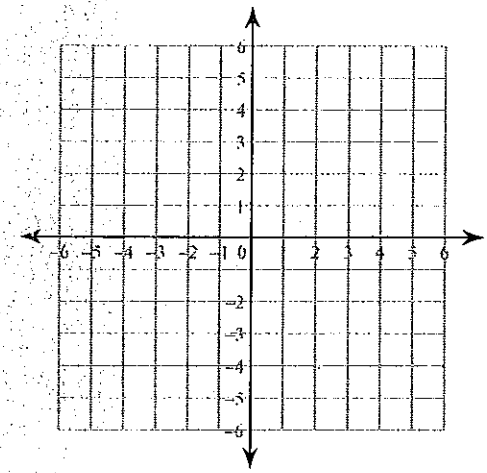
7) $y = \frac{1}{3}x - 4$



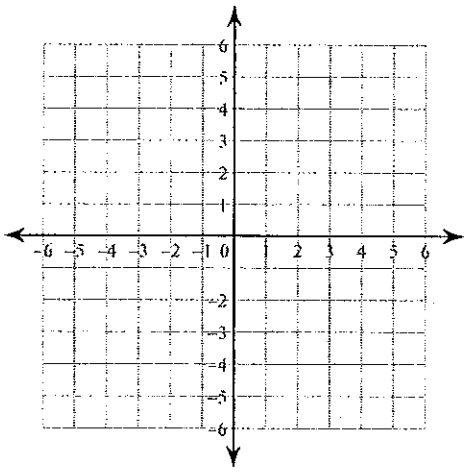
8) $y = -3x + 4$



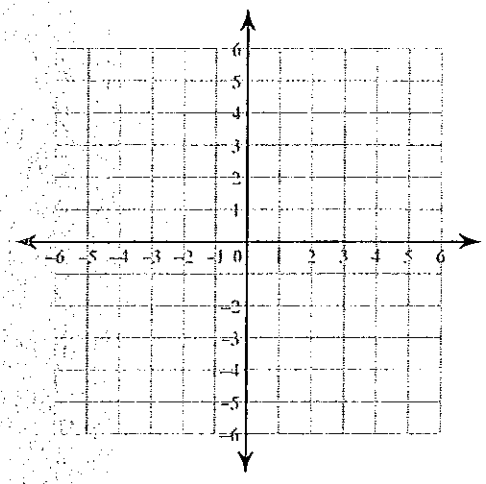
9) $y = \frac{4}{5}x$



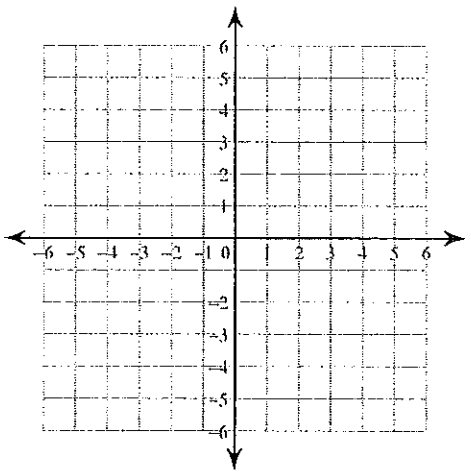
10) $y = \frac{1}{2}x + 2$



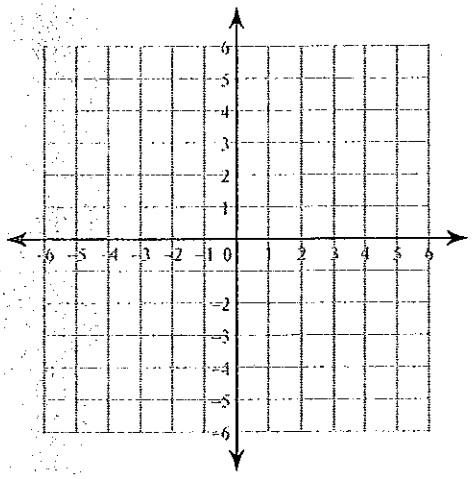
11) $y = -5x$



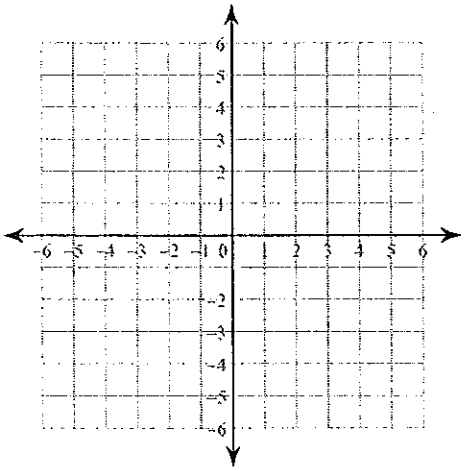
12) $y = 2x - 1$



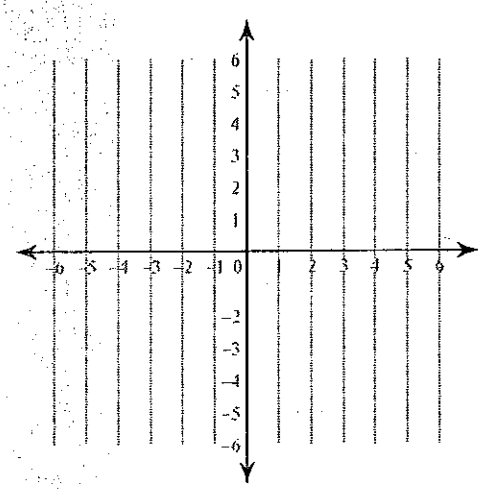
13) $y = -2x + 2$



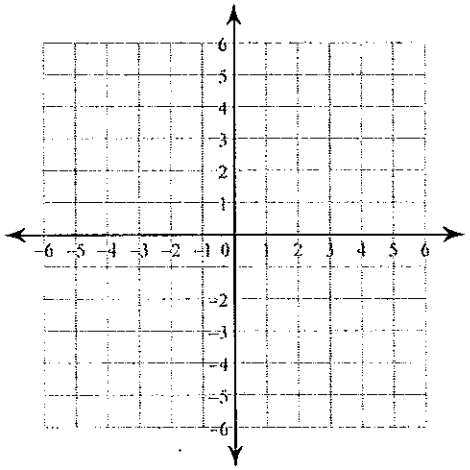
14) $y = 7x - 4$



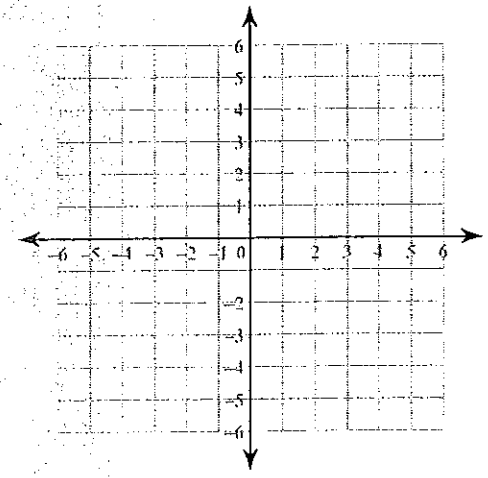
15) $y = -\frac{7}{4}x + 3$



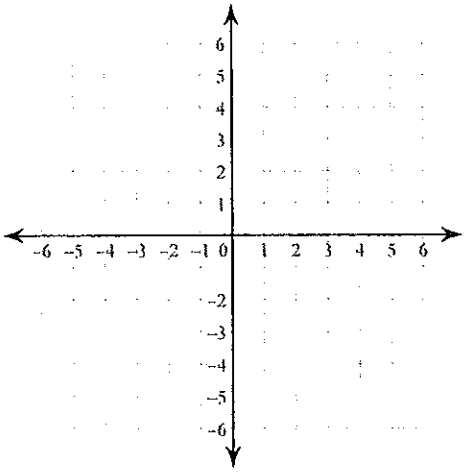
16) $y = 3x - 5$



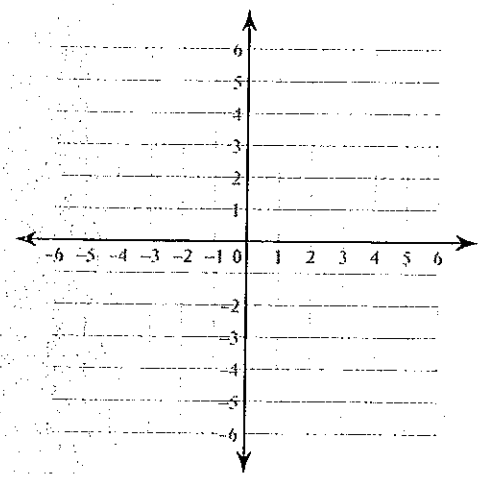
17) $y = \frac{5}{2}x + 5$



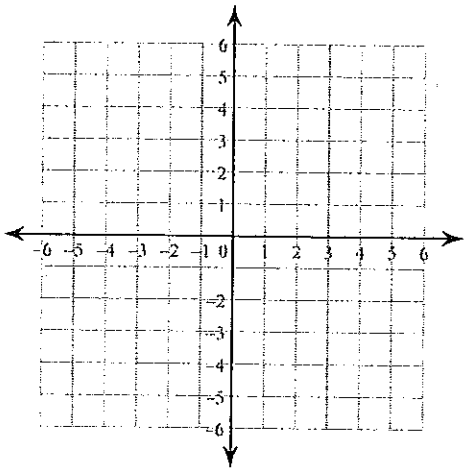
18) $y = -2x - 1$



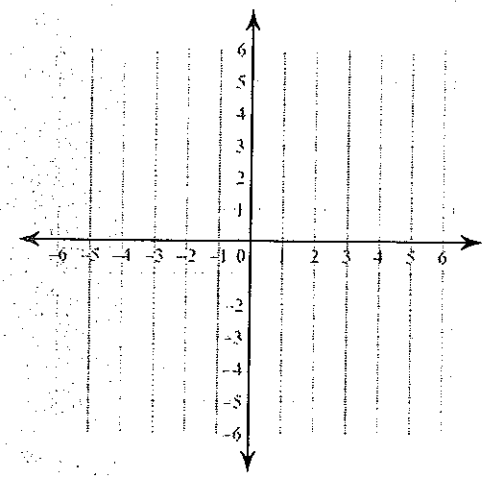
19) $y = 2$



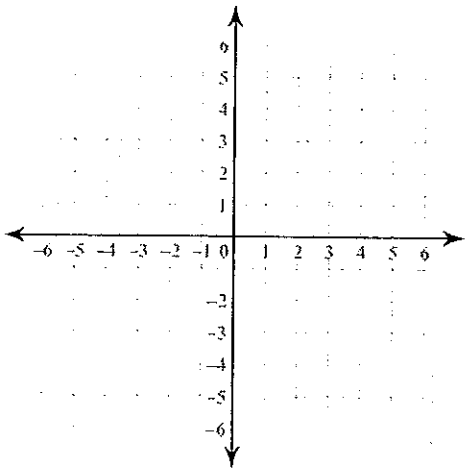
20) $y = \frac{7}{2}x + 2$



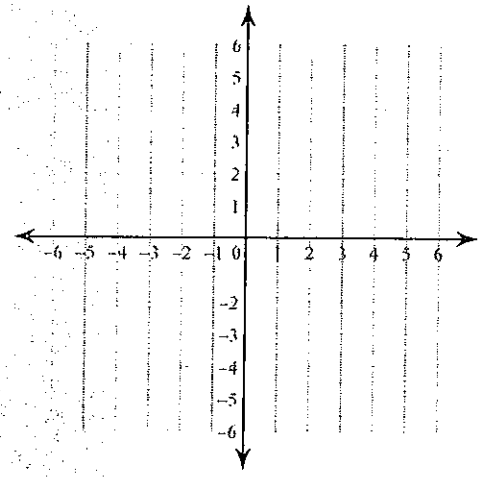
21) $y = x - 2$



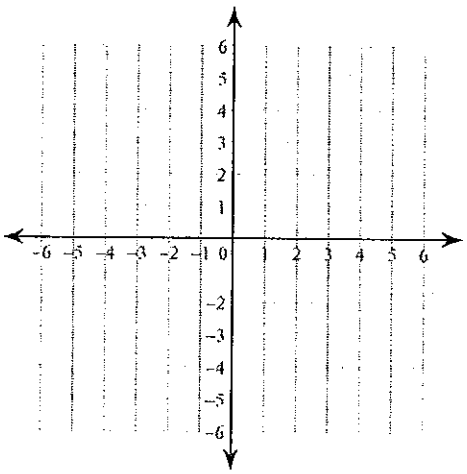
22) $y = 5$



23) $y = 3x + 1$



24) $y = -5x$



Objective:

I will be able to _____ the _____ of a line given information in four different ways:

- the _____ and the _____
- a _____
- the _____ and a _____ that lies on the line
- a _____ of values

Writing the equation of the line given the slope and y-intercept:

$$y = mx + b$$

m = _____ b = _____

Examples:

The slope is 3 and the y-intercept is -4 _____

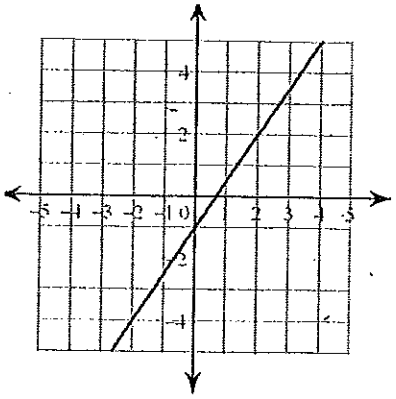
The y-intercept is 7 _____

The slope is -5 and the y-intercept is 2 _____

The slope is 3/5 and the y-intercept is -5 _____

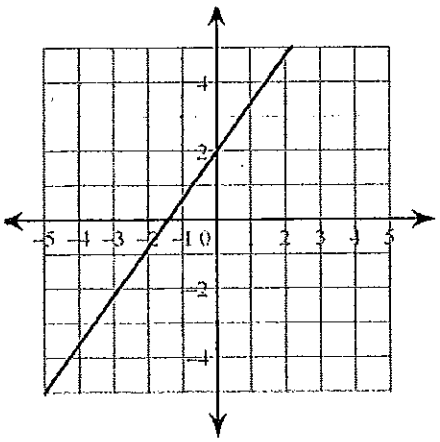
Write the equation of the line when you are given a graph:

Example 1:

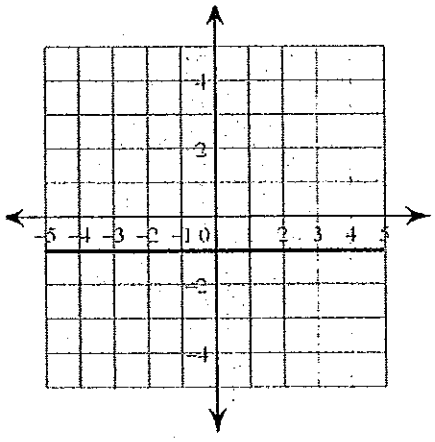


1. Find the _____ first!
2. Look for the next easily visible _____ on the line.
3. _____ to find the slope. Remember that slope is $\frac{y}{x}$ (_____ or _____ first for ____, _____ or _____next for ____).

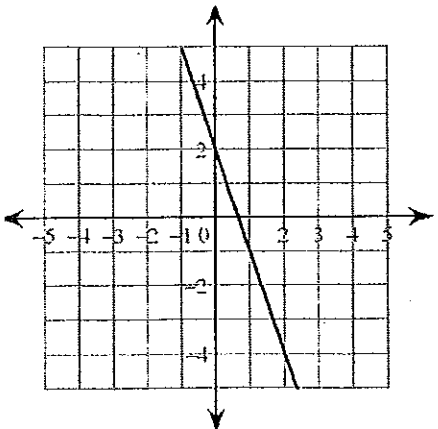
Example 2:



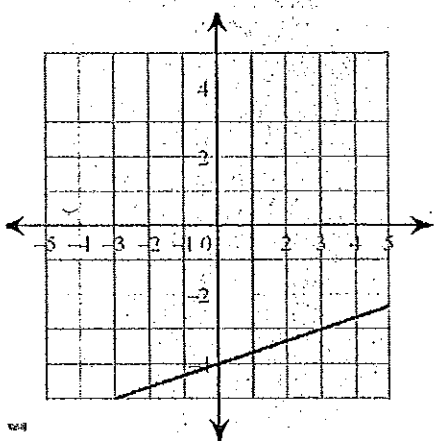
Example 3:



Example 4:



Example 5:



NAME _____ DATE _____ PERIOD _____

8-7 Skills Practice

Writing Linear Functions

Write an equation in slope-intercept form for each line.

1. slope = 7, y-intercept = 2

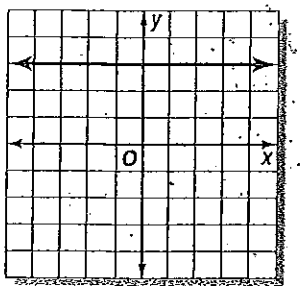
2. slope = −5, y-intercept = −3

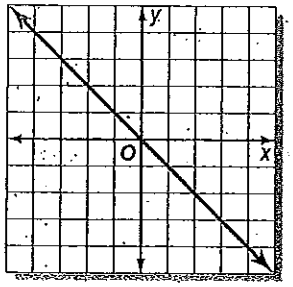
3. slope = $\frac{3}{5}$, y-intercept = 6

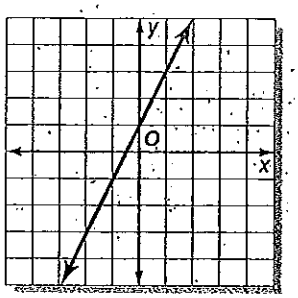
4. slope = −6, y-intercept = 7

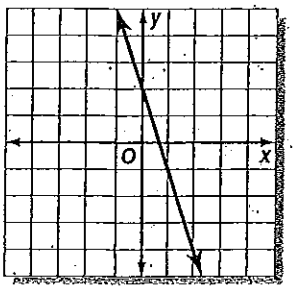
5. slope = $\frac{2}{7}$, y-intercept = 1

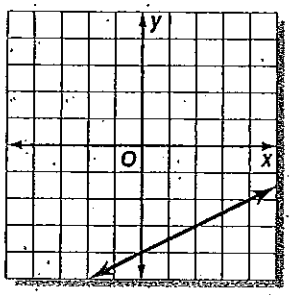
6. slope = $\frac{4}{3}$, y-intercept = −4

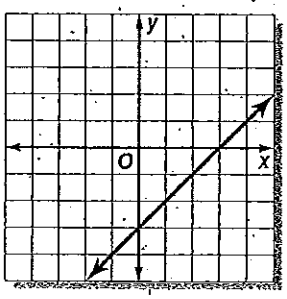
7. 

8. 

9. 

10. 

11. 

12. 

Write an equation in slope-intercept form for the line passing through each pair of points.

13. (9, −1) and (6, −2)

14. (12, 5) and (−4, 1)

15. (10, −6) and (−2, −6)

16. (4, 6) and (1, 3)

17. (6, 3) and (−6, 9)

18. (8, −4) and (−4, −1)

19. (5, 0) and (2, −3)

20. (12, −2) and (6, 2)

21. (−5, 10) and (3, −6)

Math 8 Name_____

Writing the Equation of the Line

Date_____

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

1) Slope = 1, y-intercept = 3

2) Slope = $-\frac{7}{4}$, y-intercept = –2

3) Slope = $\frac{5}{3}$, y-intercept = 0

4) Slope = $\frac{1}{5}$, y-intercept = –2

5) Slope = $-\frac{7}{3}$, y-intercept = 5

6) Slope = $-\frac{9}{2}$, y-intercept = 5

7) Slope = $-\frac{3}{2}$, y-intercept = –2

8) Slope = $\frac{3}{5}$, y-intercept = 1

9) Slope = $-\frac{1}{2}$, y-intercept = –1

10) Slope = $\frac{7}{2}$, y-intercept = –5

11) Slope = –2, y-intercept = –4

12) Slope = 5, y-intercept = 1

13) Slope $= \frac{2}{3}$, y-intercept $= 5$

14) Slope $= -\frac{4}{3}$, y-intercept $= -5$

15) Slope $= -\frac{2}{5}$, y-intercept $= -1$

16) Slope $= \frac{1}{3}$, y-intercept $= -5$

17) Slope $= -\frac{5}{4}$, y-intercept $= -2$

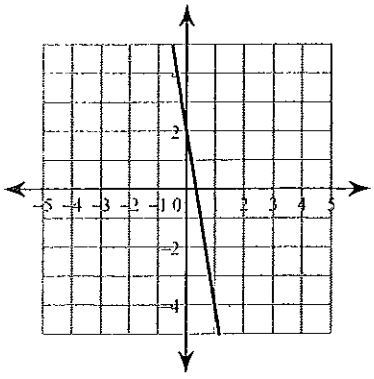
18) Slope $= -\frac{3}{2}$, y-intercept $= -1$

19) Slope $= \frac{9}{4}$, y-intercept $= -5$

20) Slope $= -\frac{2}{5}$, y-intercept $= 2$

Write the slope-intercept form of the equation of each line.

21)



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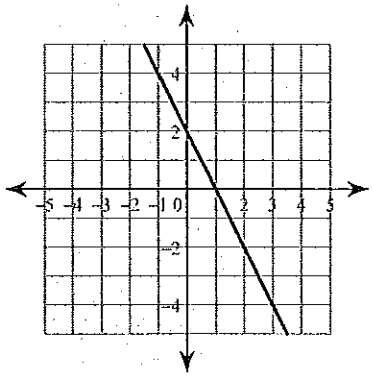

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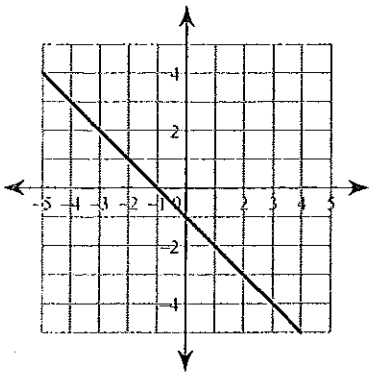

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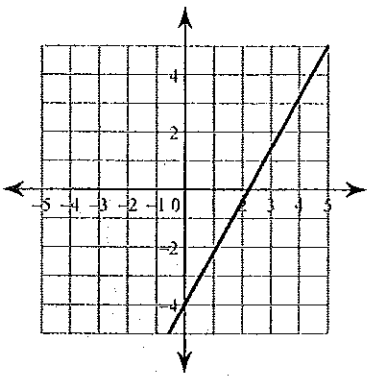

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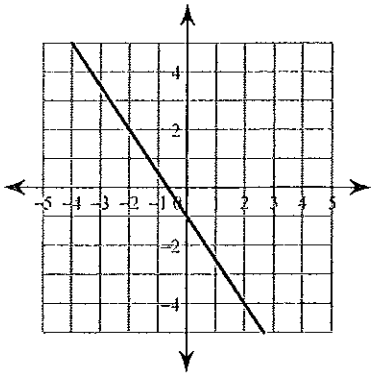

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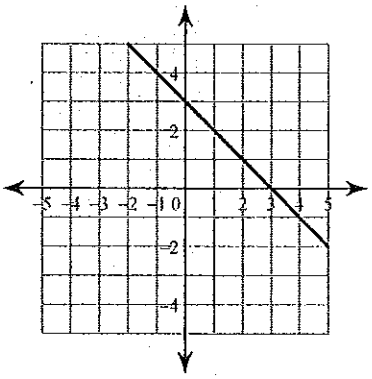

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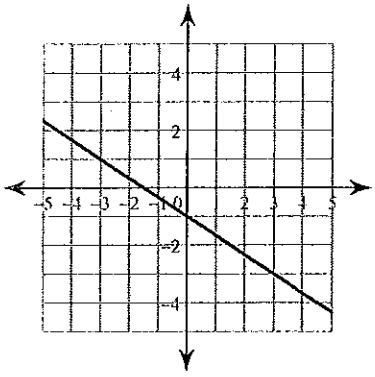
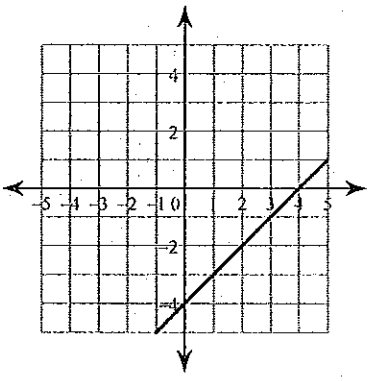


28)



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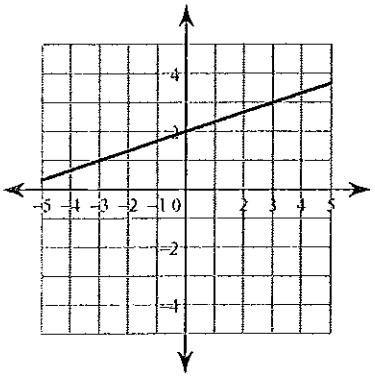

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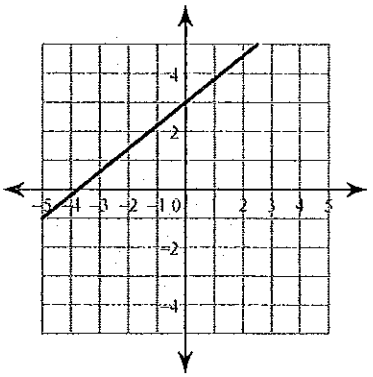
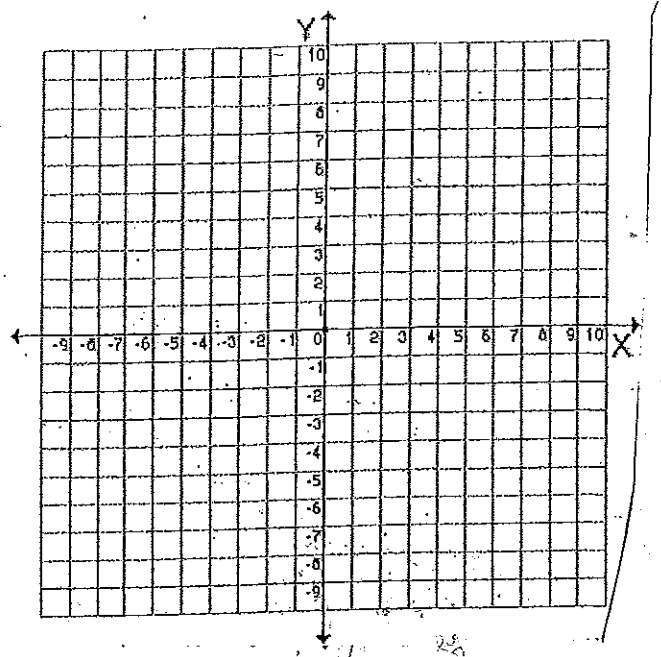


Write the equation of the line given the slope and a point that is on the line.

Ex. 1) m = 2

Point (3, 2) is on the line

$$y = mx + b$$



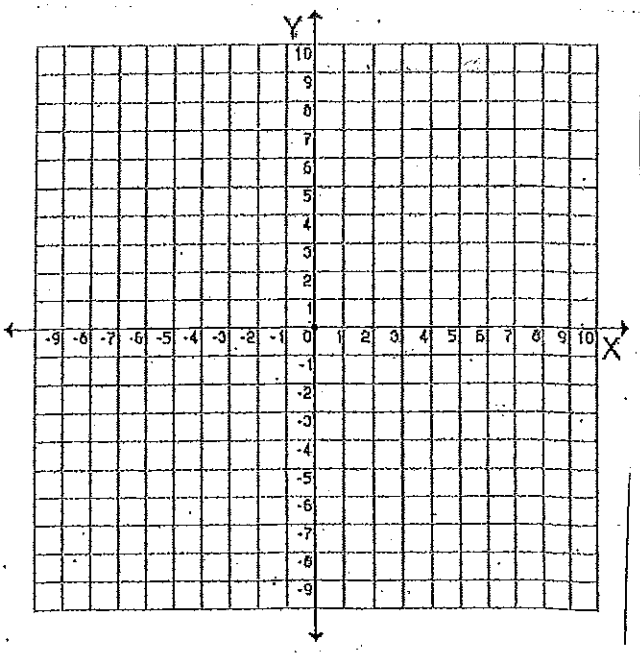
PLUG IN (substitute) the x-y values from the point into the equation to find the y-intercept!!

Solve for "b", write the equation, then graph the line.

Ex. 2) m = 2/3

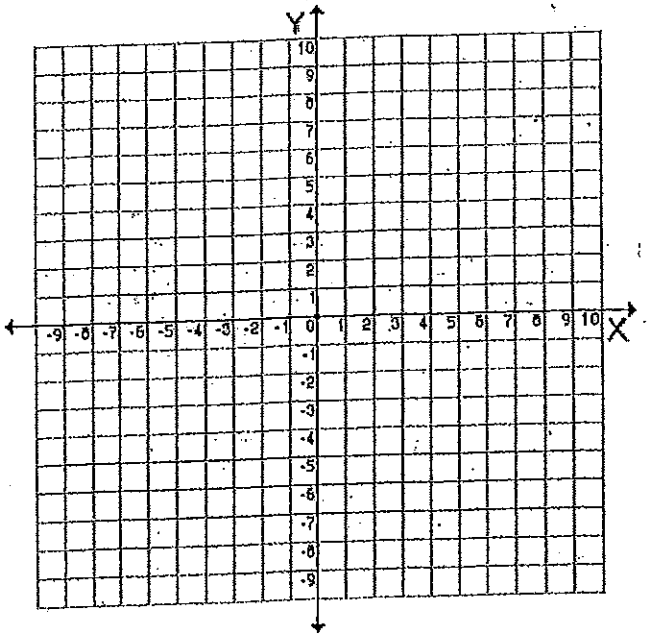
Point (-6, -2) is on the line

Use the fraction button [a b/c] on the calculator!



Ex. 3) m = -3

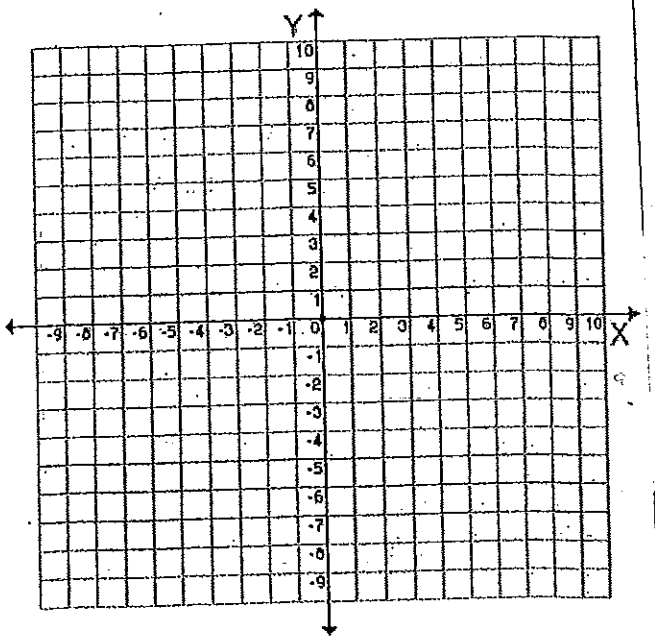
Point (3, -9) is on the line



Ex. 4) m = -1/4

Point (-8, 1) is on the line

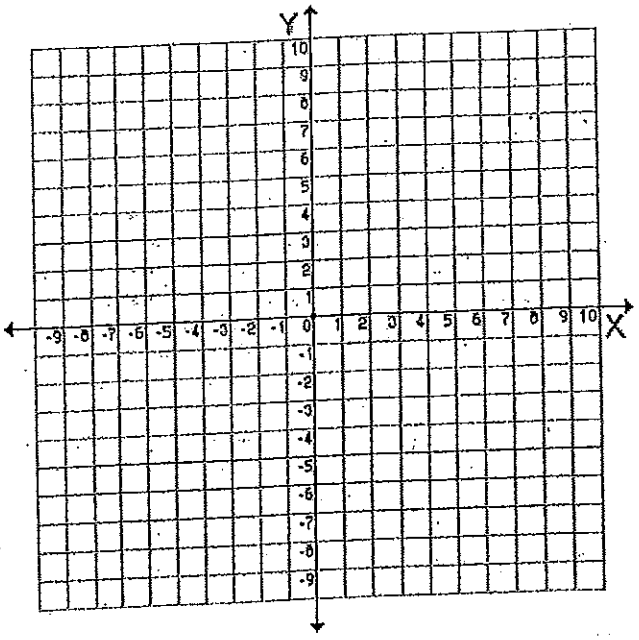
use the fraction button!



Example 5:

m = 4

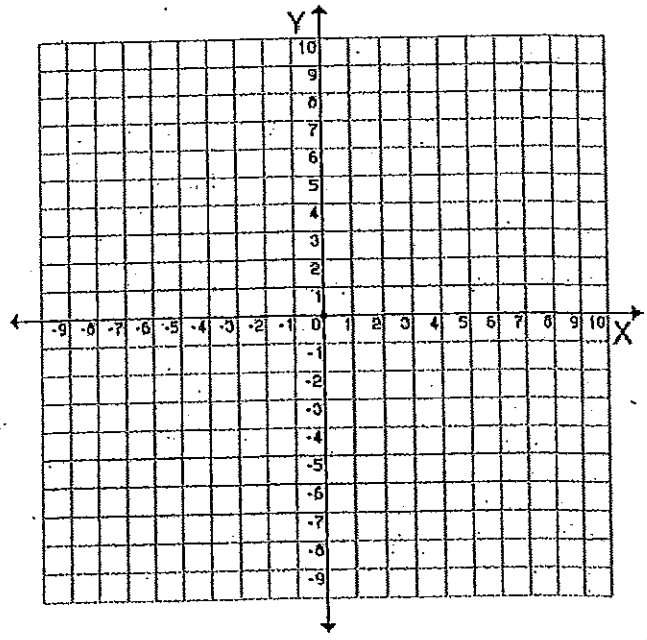
Point (3,9) is on the line



Example 6:

m = -2

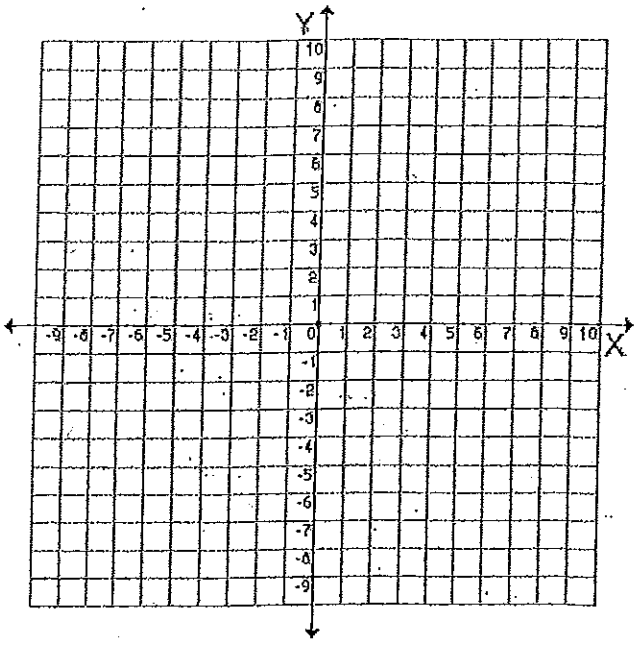
Point (3, -6) is on the line.



Example 7:

m = 3

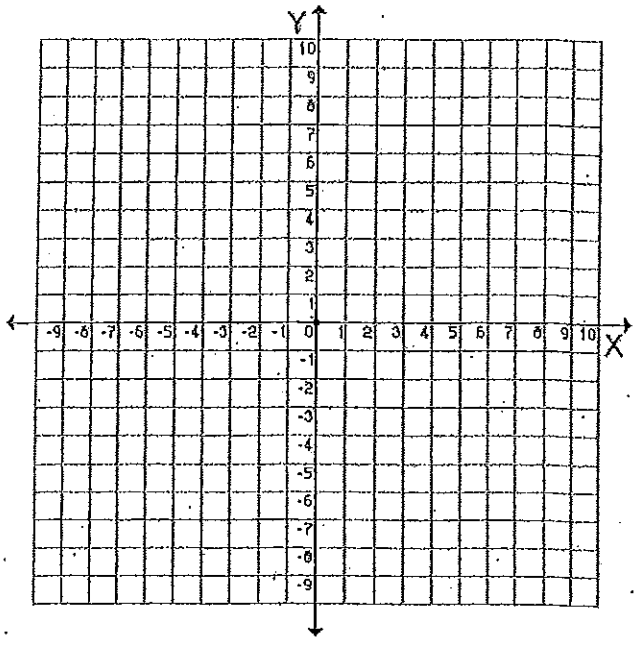
Point (-3,-5) is on the line



Example 8:

m = 1/2

Point (4,0) is on the line



Objective:

I will be able to write the equation of the line into y = mx + b format (slope-intercept) from standard form.

Slope-Intercept Form: (can easily be graphed) $y = 2x - 5$ Slope: ____ y-intercept: ____

Standard Form: (not so useful for graphing) $3x - 5y = 0$ Slope: ____ y-intercept: ____

$3x - 5y = 0$

What can we do?
- Re-write into y=mx + b
- Use algebra skills to solve for ___ !
- Leave fractions for slope

TRY THESE:

$x + y = 1$

Slope Intercept Form: _____

Slope: ____

y-intercept: _____

$3x + y = -5$

Slope Intercept Form: _____

Slope: ____

y-intercept: _____

$4x + 3y = 9$

Slope Intercept Form: _____

Slope: ____

y-intercept: _____

Math 8 Name_____ ID: 1

Rewrite y=mx +b

Date_____ Period____

Write the slope-intercept form of the equation of each line.

1) $x + y = 1$

2) $3 + y = 4x$

3) $x - 2y = 8$

4) $3x - y = 4$

5) $7x - 4y = 23$

6) $x + 2y = 6$

7) $x + 4y = -16$

8) $2x + 7y = 42$

9) $x - 2y = -2$

10) $6x - 7y = 14$

11) $y = -2$

12) $8x - 3y = 0$

13) $5x + 3y = -3$

14) $16x - 3y = 40$

15) $3x + 2y = -4$

16) $3x + 5y = 5$

17) $x - 4y = 28$

18) $x + y = -5$

19) $4x + 3y = -3$

20) $x + y = 8$

11) $y = -2$

12) $8x - 3y = 0$

13) $5x + 3y = -3$

14) $16x - 3y = 40$

15) $3x + 2y = -4$

16) $3x + 5y = 5$

17) $x - 4y = 28$

18) $x + y = -5$

19) $4x + 3y = -3$

20) $x + y = 8$

Objective: I will be able to write the equation for a line when I am given a table of values:

Example 1: What is the equation for this line?

x	y
2	10
4	18
6	26
8	34
10	42

What did we do?

1) Find the _____ using _____ _____.
2) Pick a _____ from the table and _____ values
3) Solve for _____
4) Re-write in y=mx + b form.

Write a linear equation (function) to represent the table of values.

1.

x	y
0	-3
3	3
6	9
9	15

2.

x	5	10	15	20
y	3	4	5	6

3.

x	3	9	15	21
y	-3	-5	-7	-9

4.

a	b
0	5
4	2
8	-1
12	

5.

x	y
1	-2
3	-8
5	-14
7	19

Name: _____

Write a function equation for the given table:

1.)

x	y
1	7
2	9
3	11
4	13
5	15

2.)

a	b(a)
6	15
8	21
10	27
12	33
14	39

3.)

x	f(x)
3	12
5	16
7	20
9	24
11	28

4.)

n	f(n)
-2	11
-1	16
0	21
1	26
2	31

5.)

m	n
4	0
8	8
12	16
16	24
20	32

6.)

w	z
-3	-5
-1	-1
1	3
3	7
5	11