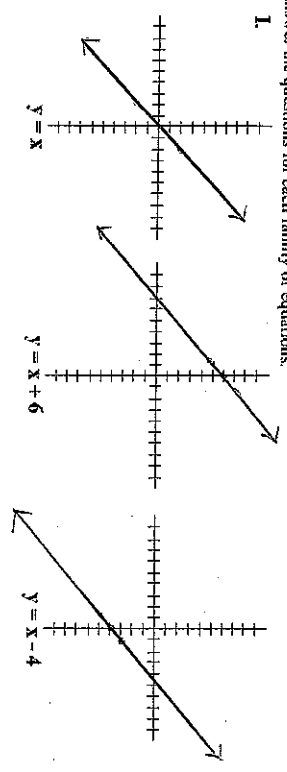


The Picture Tells the (Linear) Story II

Study the graphs:

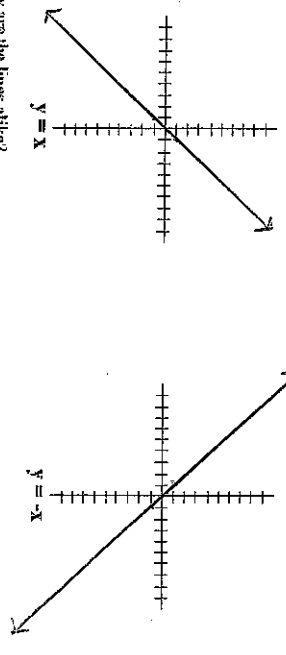
I Answer the questions for each family of equations.



- ◆ How are the lines the same?
- ◆ What is different about the lines?
- ◆ Where does each line cross the y-axis?
- ◆ What happens to the graph when a constant is added to $y = x$?

- ◆ Write an equation for a line similar to those above but crosses the y-axis at 5.
- ◆ Write an equation for a line similar to those above but crosses the y-axis at -2.

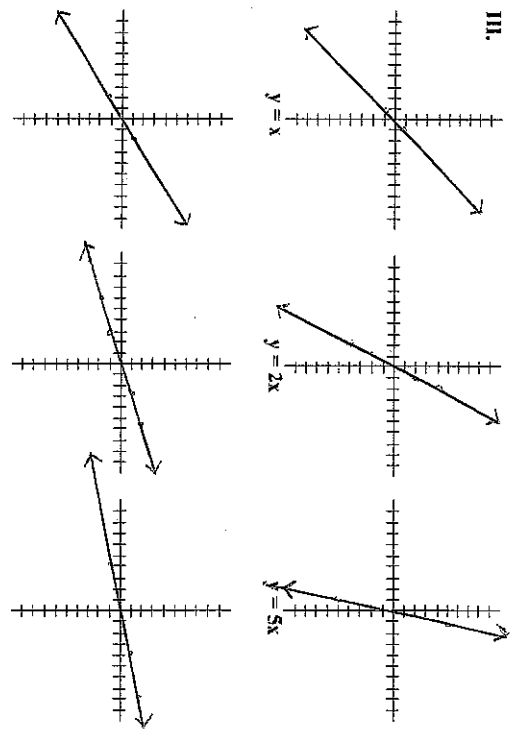
II.



- ◆ How are the lines alike?
- ◆ How are the lines different?

The Picture Tells the (Linear) Story

III.

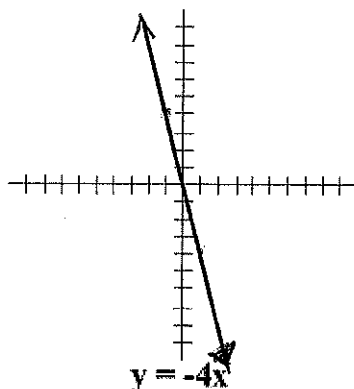
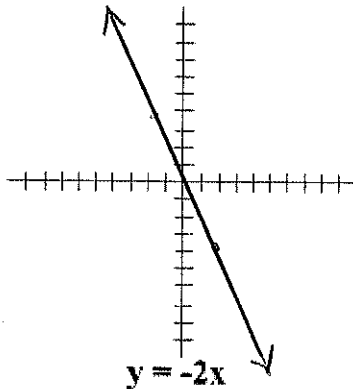
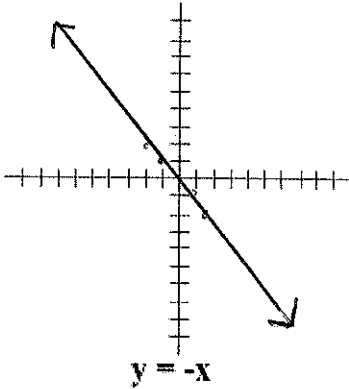


- ◆ Describe the differences in the graphs.
- ◆ Which line appears the steepest?
- ◆ What makes the difference?

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

The Picture Tells the (Linear) Story

IV.



- ◆ How are the lines different?
- ◆ Which line appears the steepest?
- ◆ What makes the difference?

V.

- ◆ Where does each of the following cross the y-axis?
- ◆ Which line is steepest and why.

$y = 2x + 7$ _____

$y = -x + 11$ _____

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

- ◆ Where does each of the following cross the y-axis?
- ◆ Which line is steepest and why.

$y = x + 8$ _____

$y = 3x - 4$ _____

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

- ◆ Where does each of the following cross the y-axis?
- ◆ Which line is steepest and why.

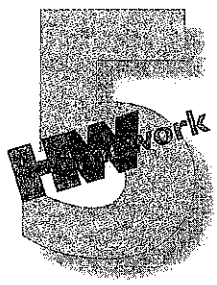
$y = -x + 8$ _____

$y = -2x + 5$ _____

$y = -\frac{1}{3}x$ _____

◆ If a linear equation can be written in the form $y = mx + b$, where m and b represent any real values, explain the effect of m on the graph of the equation.

◆ Explain the effect of b on the graph.

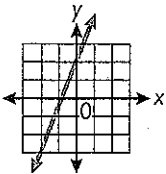


What's in an Equation?

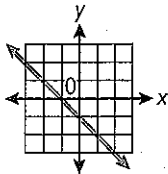
Applying Skills

Find the y -intercept of each line.

1.



2.



Find the slope and y -intercept of the graph of each equation.

3. $y = 5x + 8$

4. $y = -2x + 1$

5. $y = x - 4$

6. $y = 0.3x - 2.5$

7. $y = -3x$

8. $y = \frac{1}{4}x + \frac{2}{5}$

9. $y = 2 - x$

10. $y = 2$

11. Which equation in items 3–10 has the steepest graph? the flattest graph?

12. Which equations in items 3–10 have graphs that slant upwards from left to right?

Write the equation of a line with the following slope and y -intercept:

13. slope 7, y -intercept $(0, -9)$

14. slope -4 , y -intercept $(0, 1)$

15. slope 4.5 , y -intercept $(0, 0)$

16. slope -6 , y -intercept $(0, -1)$

Extending Concepts

Find the slope and y -intercept of the graph of each equation.

17. $2y = 4x + 6$

18. $x + y = 7$

19. $y = 5(x + 1)$

20. $y - 2x = 4$

In items 21–23, use the equations below.

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

C. $y = -2x + 4$

21. Use the slope and y -intercept to graph each equation. Label the lines A, B, and C.

22. Write an equation whose graph crosses the y -axis at a lower point than all of the given lines.

23. Write an equation whose graph crosses the y -axis at a higher point than Line A and that is steeper than all three graphs.

Making Connections

24. Fahrenheit and Celsius are different temperature scales. The equation $F = 1.8C + 32$ describes the relationship between Fahrenheit and Celsius.

a. What is the slope of the graph of this equation? How much does the Fahrenheit temperature increase when the Celsius temperature increases by 1° ? by 2° ? How do you know?

b. What is the y -intercept of the graph? What is the Fahrenheit temperature when the Celsius temperature is 0° ?

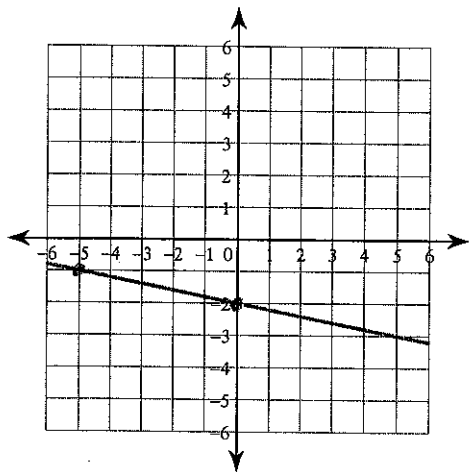
Writing Equations.

Name _____

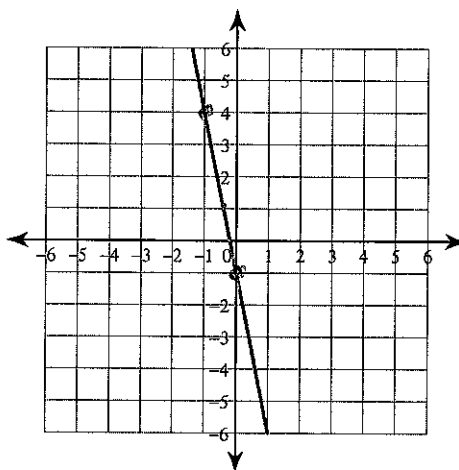
Date _____ Period _____

Write an equation for each graph.

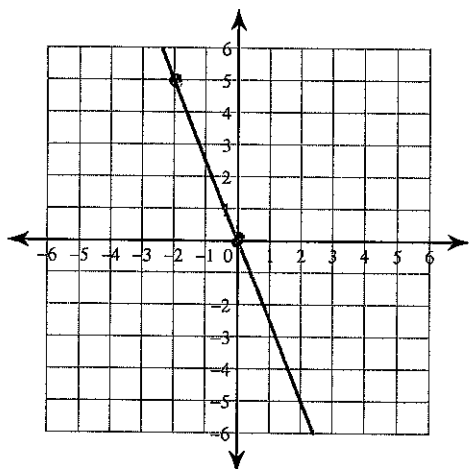
1) $y =$



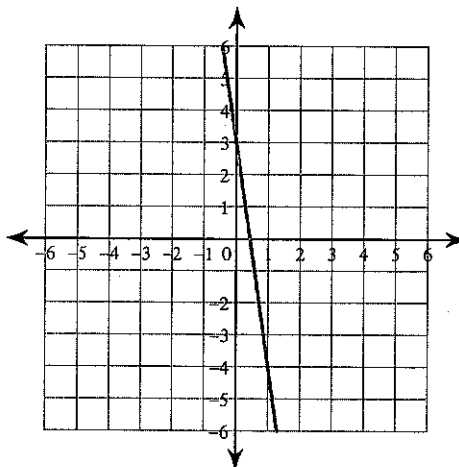
2) $y =$



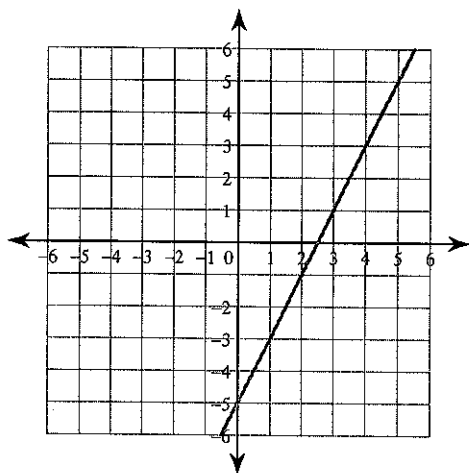
3) $y =$



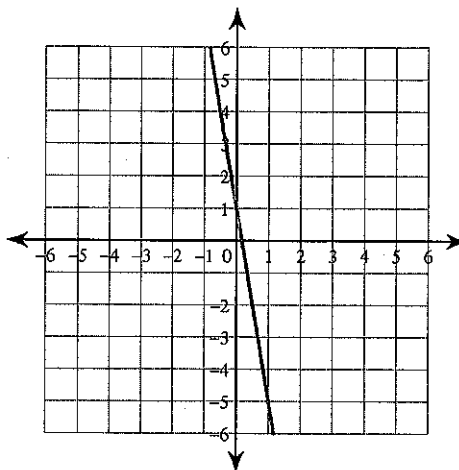
4) $y =$



5) $y =$

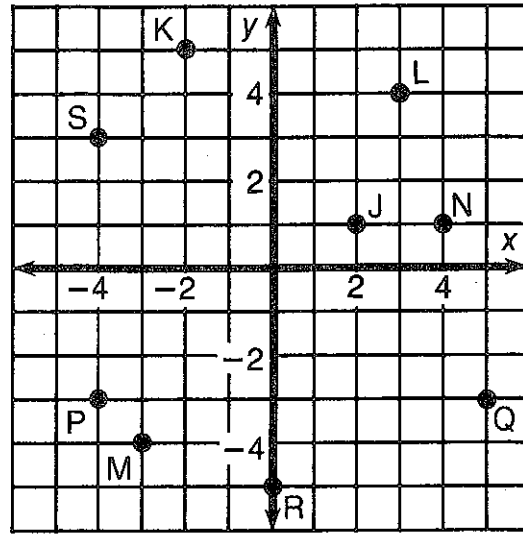
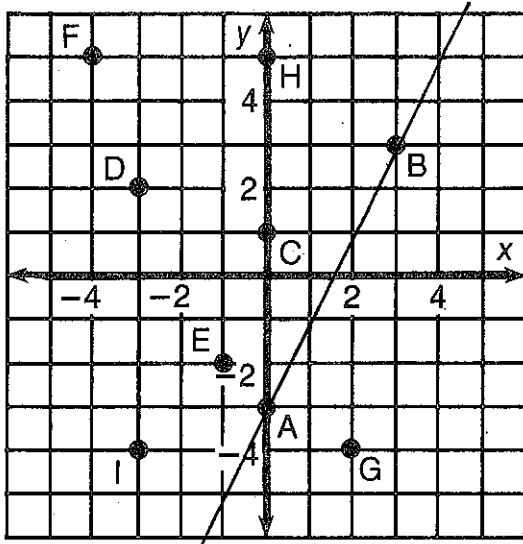


6) $y =$



What Did the Ape Think of the Grape's House?

For each exercise, draw the line indicated and write its equation. Find your answer in the answer section and notice the two letters next to it. Print these letters in the two boxes at the bottom of the page that contain the number of that exercise.



- ① Equation of \overleftrightarrow{AB} _____
- ② Equation of \overleftrightarrow{CB} _____
- ③ Equation of \overleftrightarrow{DE} _____
- ④ Equation of \overleftrightarrow{FG} _____
- ⑤ Equation of \overleftrightarrow{HI} _____

- ⑥ Equation of \overleftrightarrow{JK} _____
- ⑦ Equation of \overleftrightarrow{LM} _____
- ⑧ Equation of \overleftrightarrow{NS} _____
- ⑨ Equation of \overleftrightarrow{PQ} _____
- ⑩ Equation of \overleftrightarrow{RQ} _____

Answers:

DE $y = -\frac{1}{4}x + 2$

TT $y = \frac{2}{5}x$

EA $y = -2x + 3$

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

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

VI $y = \frac{2}{5}x - 5$

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

OU $y = -x + 3$

TH $y = -2x - 4$

AS $y = 2x - 3$

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

TI $y = \frac{4}{3}x$

HE $y = 3x + 5$

TW $y = -3$

SH $y = \frac{2}{3}x + 5$

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

Graphing Equations Notes

Example: Graph $y = 2x - 4$

1. Identify the slope and y-intercept:

Slope _____

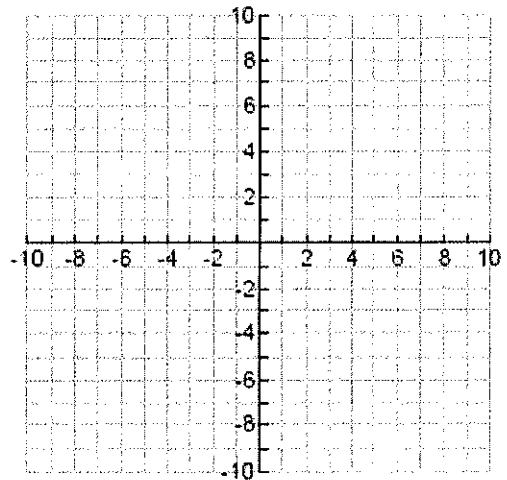
y-intercept: _____

2. Graph the y-intercept on the coordinate plane.

3. Next, count the slope (change in y over the change in x) from the y-intercept and place a second point.

4. Use the slope again to plot at least one other point.

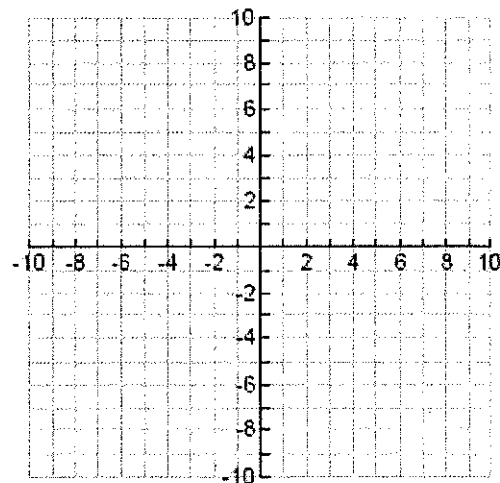
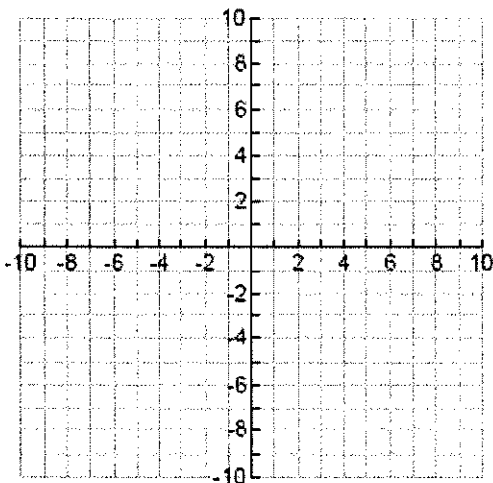
5. Draw a line through the points.



You Try:

1. Graph $y = -\frac{1}{2}x + 2$

2. Graph $y = 3x - 1$



Graphing in Slope-Intercept Form

Slope-Intercept Form:

X and Y are _____ (X, Y) is any point that is on the line of the given equation.

M is the _____ can be defined as _____

B is the _____

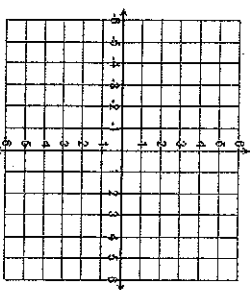
B is where the line intersects the _____

Directions: Write each linear equation in slope-intercept form and then graph it.

1. $m = \frac{1}{2}$ $b = (0, -4)$

Equation:

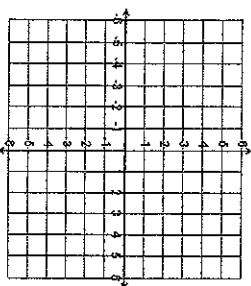
Graph:



2. $m = -\frac{1}{4}$ $b = (0, 3)$

Equation:

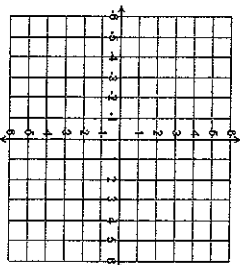
Graph:



3. $m = -3$ $b = (0, 6)$

Equation:

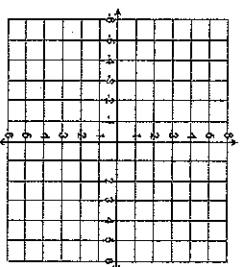
Graph:



4. $m = \frac{2}{3}$ $b = (0, -3)$

Equation:

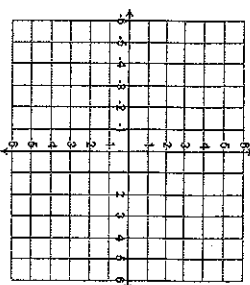
Graph:



5. $m = -1$ $b = (0, 4)$

Equation:

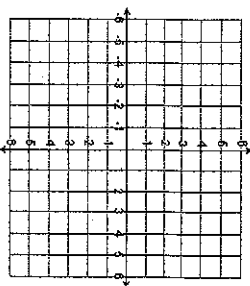
Graph:



6. $m = -2$ $b = (0, 0)$

Equation:

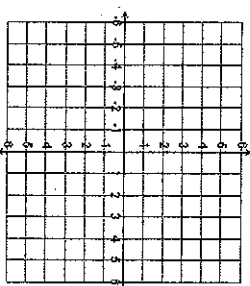
Graph:



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

$m =$

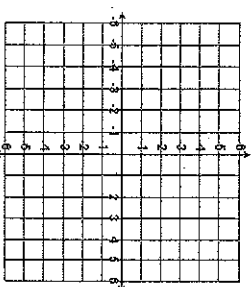
$b =$



8. Graph $y = 2x - 4$

$m =$

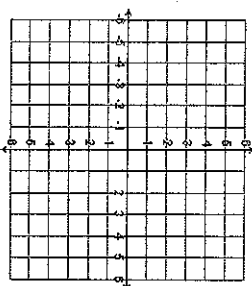
$b =$



9. Graph $y = -\frac{3}{2}x + 4$

$m =$

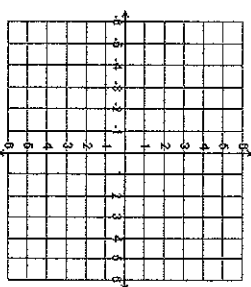
$b =$



10. Graph $y = -x + 1$

$m =$

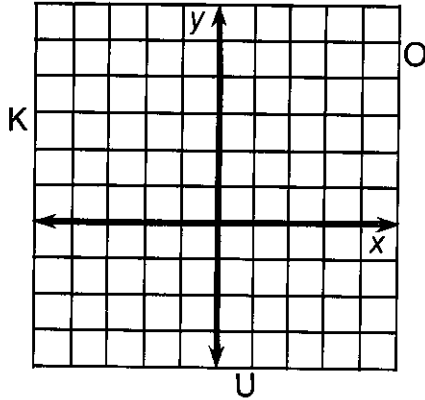
$b =$



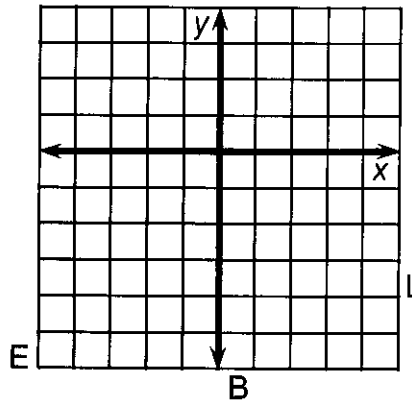
Whom Should You See at the Bank If You Need To Borrow Money?

Use the slope and y -intercept to graph each equation below. The graph, if extended, will cross a letter. Print this letter in each box that contains the number of that exercise.

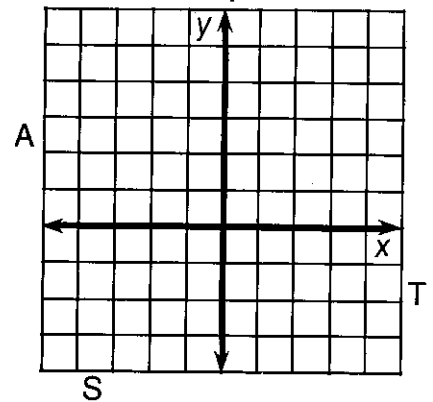
① $y = \frac{2}{3}x + 1$



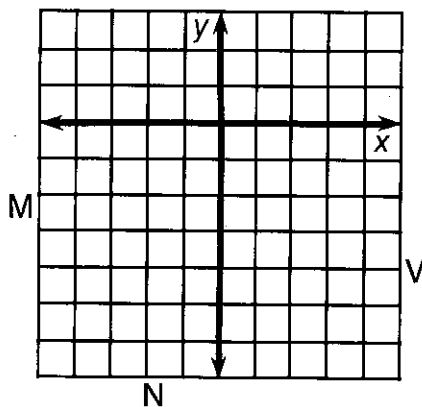
② $y = \frac{1}{2}x - 3$



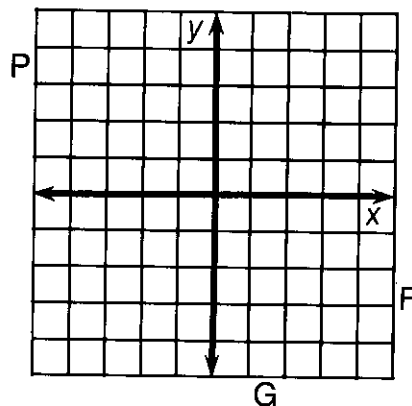
③ $y = -\frac{3}{4}x + 2$



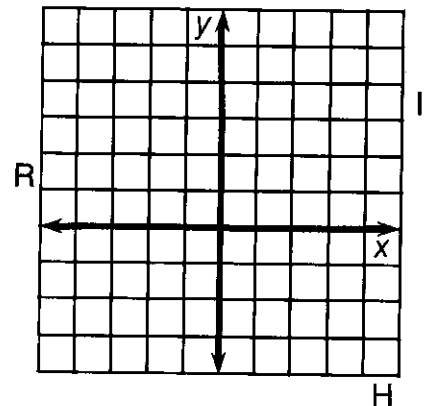
④ $y = 2x - 4$



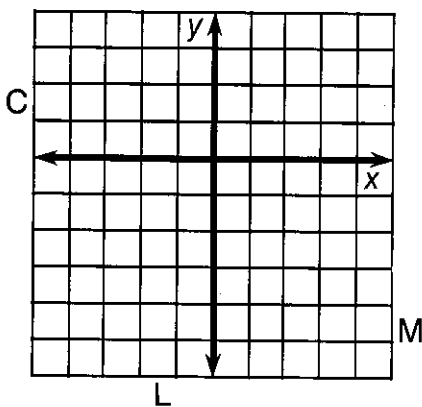
⑤ $y = -3x - 1$



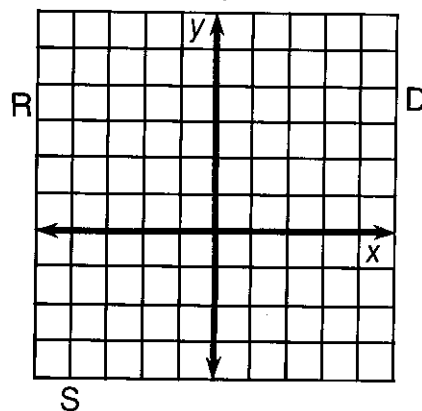
⑥ $y = -\frac{3}{2}x + 3$



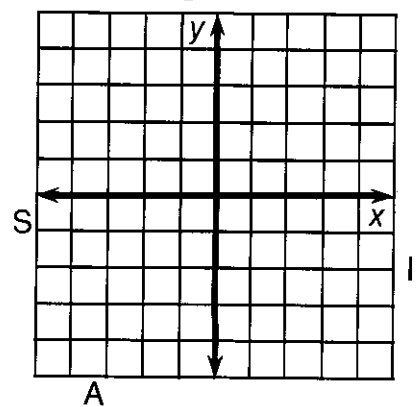
⑦ $y = 4x - 2$



⑧ $y = -\frac{1}{4}x + 2$



⑨ $y = \frac{5}{3}x$



3	6	2	7	1	9	4	9	8	8	9	4	5	2	8
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Name: _____ Date: _____

Math 8: HW #6 – Slope-Intercept Form

Writing Linear Equations

$$y = mx + b \quad (m \text{ stands for slope and } b \text{ stands for } y\text{-intercept})$$

1. $y = 6x + 3$ slope _____ y -intercept _____

2. $y = -5x - 4$ slope _____ y -intercept _____

3. $y = 7 - 9x$ slope _____ y -intercept _____

4. $y = -13x$ slope _____ y -intercept _____

5. $y = 8$ slope _____ y -intercept _____

6. Given slope of -2 and the y -intercept is -6 . _____

7. Given slope of $\frac{3}{7}$ and the y -intercept is -1 . _____

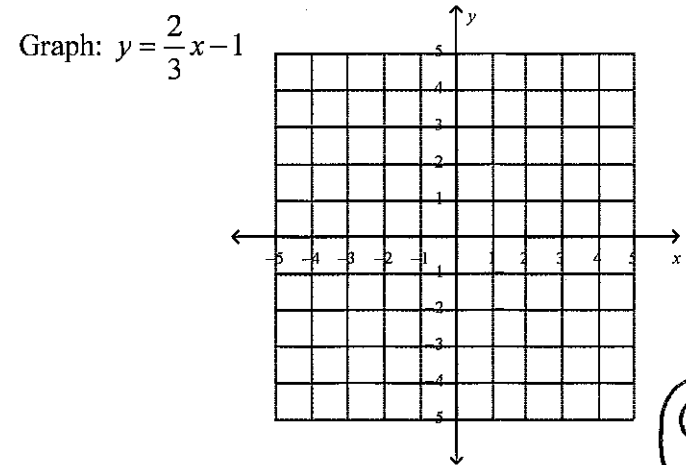
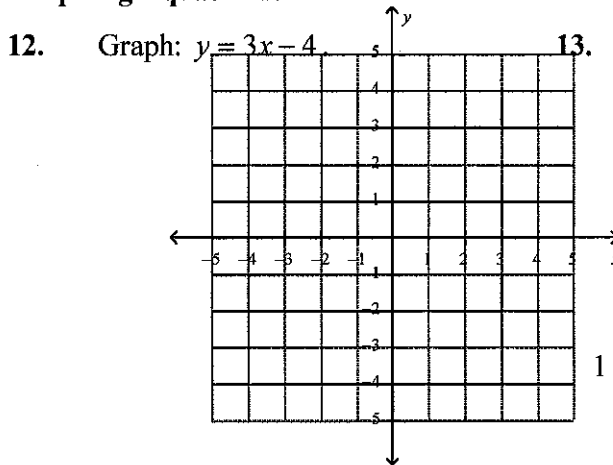
8. Given $m = -8$ and $b = 11$. _____

9. Given $m = 0$ and $b = -5$. _____

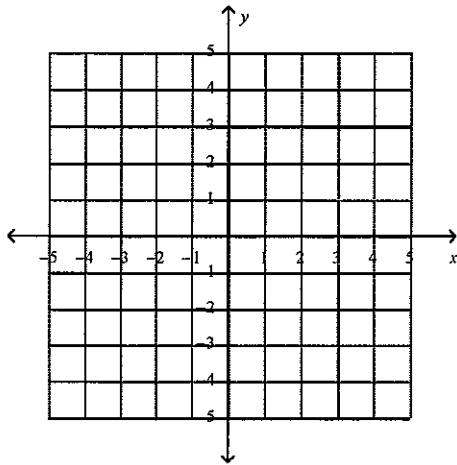
10. Given $m = -11$ and the y -intercept is $(0, 13)$. _____

11. Given slope of $\frac{4}{3}$ and $b = 0$ _____

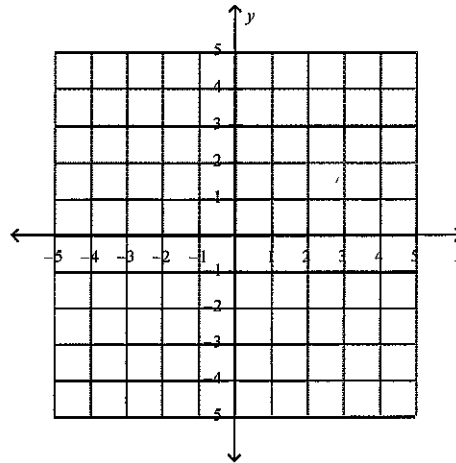
Graphing Equations:



14. Graph: $y = -2x + 4$



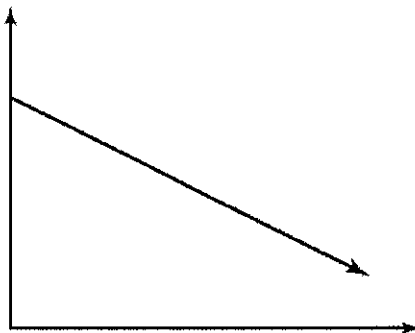
15. Graph: $y = -\frac{1}{2}x$



16. Sarah's cell phone plan costs \$50 per month. Her plan does not include text messaging, which is an additional 15 cents per text message.

- A. Write an equation to represent the total cost C of Sarah's cell phone plan per month. Use t to represent the number of text messages.
- B. If Sarah sends and receives a total of 90 text messages during October, how much will Sarah's cell phone plan cost that month? **SHOW ALL WORK.**
- C. Suppose Sarah paid \$59 for her cell phone bill. How many total text messages did she send and receive? Show all work.

17. Which situation is best represented by the graph below?



- A the height of a child from age ten to fifteen
- B the volume of a balloon as it is being filled with air
- C the amount of gasoline in a car's tank during a five-hour trip
- D the volume of water in a swimming pool as it is being filled

Student Name: _____

Score: _____

Find Equation of Straight Line

Find equation of straight line from the given slope and y-intercept:

Slope	y-intercept	Equation of straight line
2	5	
4	-1	
-3	-1	
$\frac{2}{3}$	5	
0	-6	
1	3	
-1	0	

Finding Equations of Lines

Find the equation of the line given the following information.

Slope and y-intercept:

1. $m = 3$, point $(0, 7)$

2. $m = \frac{2}{5}$, point $(0, 1)$

3. $m = \frac{1}{3}$, point $(0, -3)$

4. $m = -\frac{4}{3}$, point $(0, -12)$

5. $m = 2.1$, point $(0, 3.5)$

6. $m = -5.9$, point $(0, -25.9)$

Slope and point -- non y-intercept:

7. $m = -4$, point $(1, 3)$

8. $m = -\frac{3}{4}$, point $(-4, -1)$

9. $m = \frac{2}{9}$, point $(5, 2)$

10. $m = \frac{1}{6}$, point $(8, -3)$

11. $m = 7$, point $(2, 11)$

12. $m = \frac{1}{5}$, point $(3, 4)$

Two points:

13. $(1, 5)$ and $(-2, -4)$

14. $(-3, -1)$ and $(0, -2)$

15. $(11, 14)$ and $(14, 12)$

16. $(2, 7)$ and $(3, 10)$

17. $(-5, 4)$ and $(-6, 0)$

18. $(2, 5)$ and $(6, 6)$

Writing Equations Given 2 points.

Model Problem 1)

What is the equation for the line that passes through the points (3, 4) and (5, 8)?

1. Calculate Slope

$$\frac{y-y}{x-x}$$

2. Plug slope into $y=mx+b$

3. Plug a given x and y
into $y=mx+b$

4. Solve for b . 5. Rewrite equation w/ slope & y -intercept.

Model Problem 2)

What is an equation for the line that passes through the coordinates (4, 5) and (8, 3)?

Model Problem 3)

What is the equation for the line that passes through the coordinates (1, 2) and (5, 10)?

Writing Equations Given 2 points

Practice Problems

1) What is an equation for the line that passes through the coordinates (2,7) and (0, 1)?

2) What is an equation for the line that passes through the coordinates (2,0) and (0,3) ?

3) What is an equation for the line that passes through the coordinates (-1,2) and (7,6) ?

4) Find the equation of the line that passes through the points (1,1) and (3,5)?

5) Find the equation of the line that passes through the points (1,3) and (2,4) ?

Writing Equations Given 2 points

6) Find the equation of the line that passes through the points (2, 6) and (-2, 4) ?

7) Find the equation of a line that passes through the points (2, 16) and (-1, 7).

8) Find the equation of a line that passes through the points (2,13) and (1,8)

9) Find the equation of a line that passes through the points (4, 3) and (8,1)

Challenge Questions

10) Find the equation of a line that passes through the points (2, 5) and (2, 12).

11) Find the equation of a line that passes through the points (5, 3) and (2, 3).

NAME: _____ DATE: _____ Period: _____

Unit 11- Study guide

Write the following formulas or equations.

1. Slope (when given 2 pts): _____

2. Slope-Intercept Form: _____

Determine the slope of the line that passes through each pair of points.

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

Write the equation of the line in slope intercept form passing through the given point and having the given slope.

9. (3,1); $m = \frac{1}{4}$ 10. (0, 9); $m = 2$ 11. (-6, -2); $m = -\frac{1}{3}$ 12. (1, -3); $m = -1$

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

13. (-1, -7) and (1, 3) 14. (5, 3) and (-4, 3)

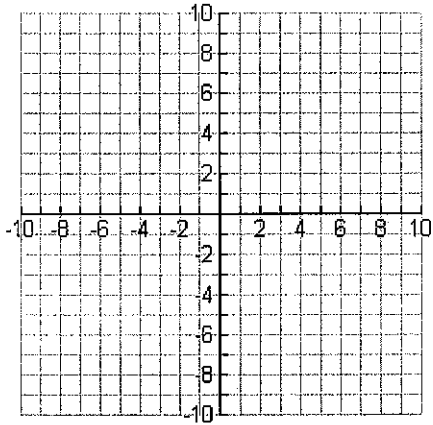
Determine whether the following points lie on the line $y = 3x + 1$

14. (-5, -14) 15. (0,1) 16. (2,10)

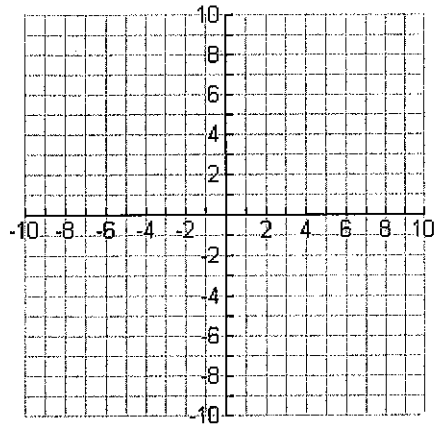
17. Find a point on the line $y = 2x - 5$

Graph the following equations.

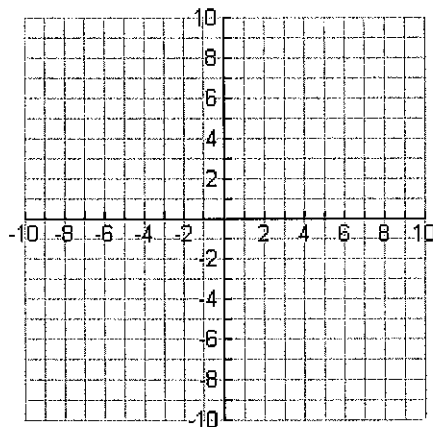
18. $y = 4x - 7$



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



20. $y = -4x$



21. $y = x + 3$

