

Study the notes for SLOPE

SLOPE FROM GRAPHS

Step 1

Create a right triangle, connecting one point to the next

Step 2

Count the number of units the triangle rises and runs

Step 3

Find 2 points with integer values

Step 4

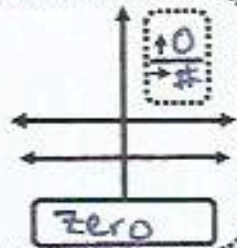
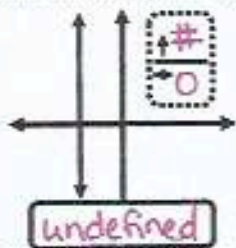
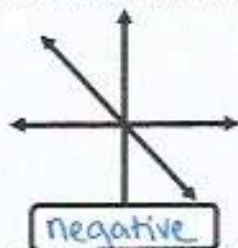
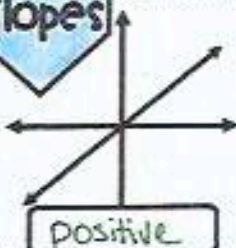
$$\text{Slope} = \frac{\uparrow \text{rise}}{\rightarrow \text{run}}$$

$$\text{Slope} = \frac{\uparrow 2}{\rightarrow 1}$$

Step 5

Determine whether the slope is positive, negative, zero or undefined

Slopes



SLOPE FROM POINTS

(2, 3) and (4, 6)

x_1 y_1

x_2 y_2

Formula

Answer

$$\frac{y_2 - y_1}{x_2 - x_1} \rightarrow \frac{6 - 3}{4 - 2} = \frac{3}{2}$$

table

Slope

change in y
change in x

Answer

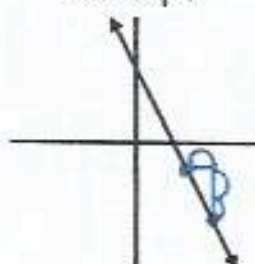
	x	y	
+ 1	0	1	+ 3
+ 1	1	4	+ 3
+ 1	2	7	+ 3
	3	10	

$$\frac{\Delta y}{\Delta x} = \frac{3}{1}$$

$$\boxed{= 3}$$

PRACTICE

#1 Find the slope of the graph!



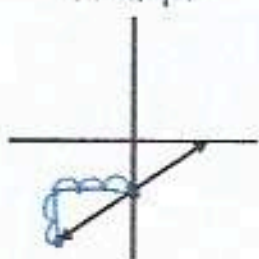
$$\text{Slope} = \frac{\uparrow 2}{\rightarrow 1} = \frac{+2}{-1}$$

Slope From Graphs

$$\frac{\uparrow \text{rise}}{\rightarrow \text{run}}$$

circle one!

#2 Find the slope of the graph!



$$\text{Slope} = \frac{\uparrow 2}{\rightarrow 3} = \frac{+2}{-3}$$

Points

#1 Find the slope of the two points!

x_1, y_1 and x_2, y_2
(9, 0) and (5, 1)

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Slope} = \frac{1 - 0}{5 - 9}$$

$$= \frac{1}{-4}$$

#2 Find the slope of the two points!

x_1, y_1 and x_2, y_2
(5, -2) and (6, -5)

$$\text{Slope} = \frac{-5 - (-2)}{6 - 5} = \frac{-3}{1}$$

$$= -3$$

Tables

#1 Find the slope of the table!

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

$$\frac{\Delta 4}{\Delta 3}$$

$$\text{Slope} = \frac{\Delta 3}{\Delta 4} = \frac{3}{4}$$

#2 Find the slope of the table!

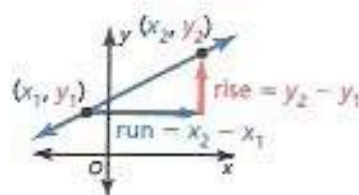
x	y
-2	1
-1	-2
0	-5
1	-8

$$\text{Slope} = \frac{\Delta 4}{\Delta 1} = \frac{-3}{1} = -3$$

Slope of a Line

The **slope** of a nonvertical line is the ratio of vertical change (*rise*) to horizontal change (*run*) between any two points on the line. If a line in the coordinate plane passes through points (x_1, y_1) and (x_2, y_2) , then the slope m is

$$m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$



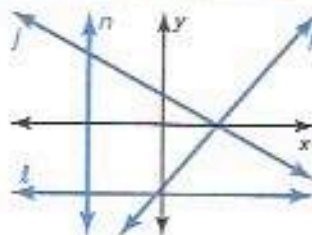
Slopes of Lines in the Coordinate Plane

Negative slope: falls from left to right, as in line j

Positive slope: rises from left to right, as in line k

Zero slope (slope of 0): horizontal, as in line ℓ

Undefined slope: vertical, as in line n



Example 1 Find the slope of the line shown.

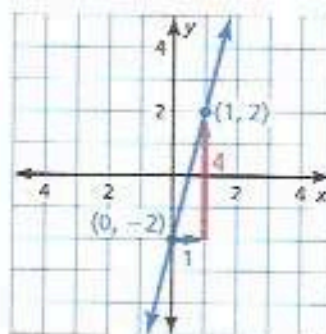
Let $(x_1, y_1) = (0, -2)$ and $(x_2, y_2) = (1, 2)$.

$$\begin{aligned} \text{slope} &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{2 - (-2)}{1 - 0} \\ &= 4 \end{aligned}$$

Write formula for slope.

Substitute.

Simplify.



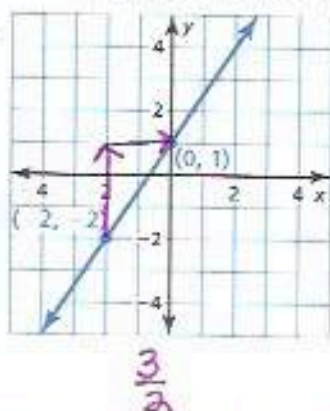
Practice

Find the slope of the line.

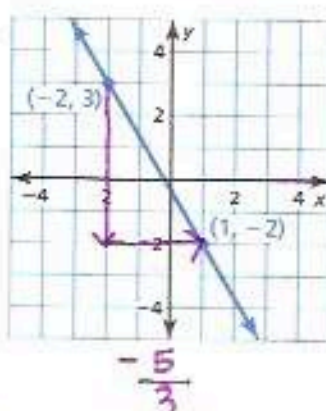
rise
run

Check your answers at BigIdeasMath.com.

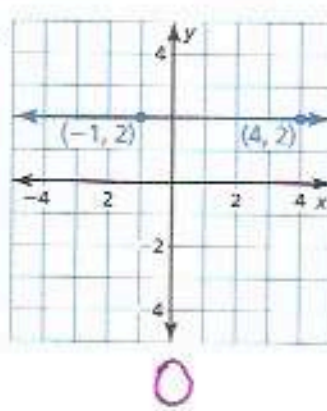
1.



2.



3.

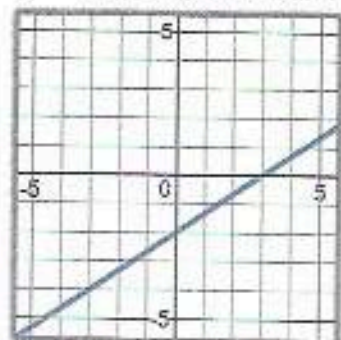


Packet Day 17

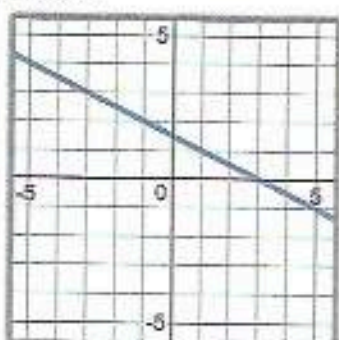
Slope Assignment!

NAME: _____

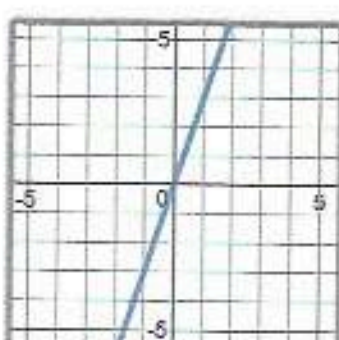
1) Find the slope of the lines below.



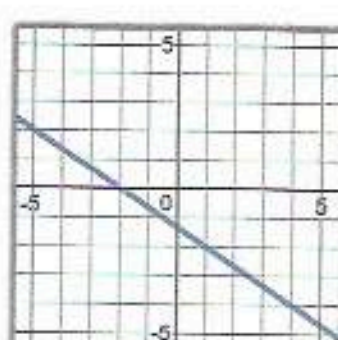
a) $m =$



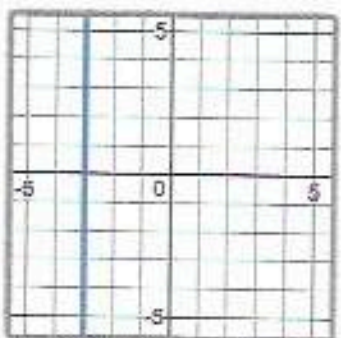
b) $m =$



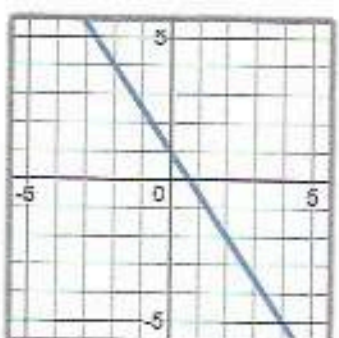
c) $m =$



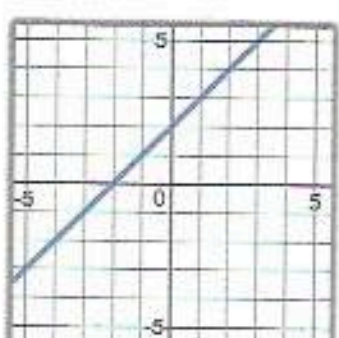
d) $m =$



e) $m =$



f) $m =$



g) $m =$



h) $m =$

2) Find the slope of the lines containing the following points.

a) $(1, 5)$ & $(3, 12)$

b) $(-2, 1)$ & $(-5, 5)$

c) $(-1, 7)$ & $(-6, 1)$

d) $(-3, 4)$ & $(13, 8)$

e) $(3, -10)$ & $(4, -21)$

f) $(3, 6)$ & $(11, 6)$

g) $(11, 12)$ & $(1, 8)$

h) $(-2, -1)$ & $(-8, 11)$

i) $(-99, 38)$ & $(-99, 722)$

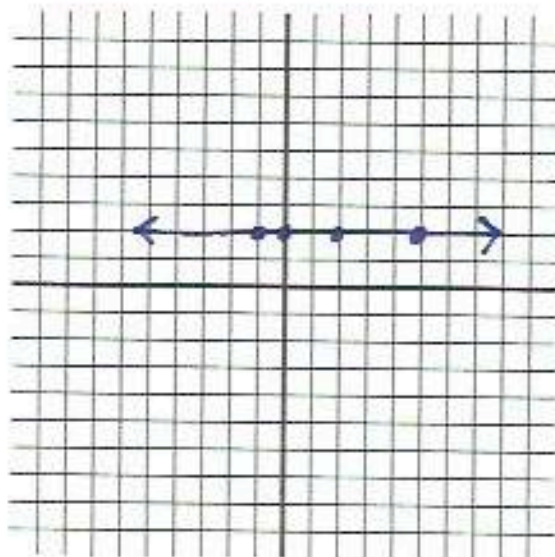
Algebra Exploration notes

Horizontal & Vertical Lines

name: _____

I. Graph the points and connect to make a line.

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



II. Find the slope of the line.

0

III. Which variable seems to be "stuck" on a particular number?

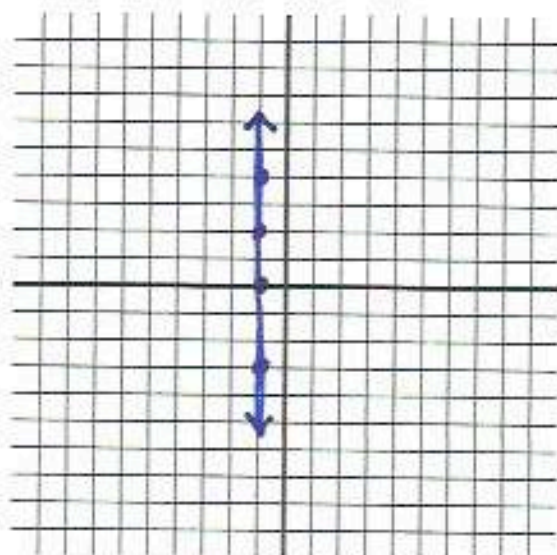
y

IV. Write an equation that would guarantee every y-coordinate is 2.

$$y = 2$$

V. Graph the points and connect to make a line.

$(-1, 2)$, $(-1, 0)$, $(-1, 4)$, and $(-1, -3)$



VI. Find the slope of the line.

undefined

VII. Which variable seems to be "stuck" on a particular number?

x

VIII. Write an equation that would guarantee every x-coordinate is -1.

$$x = -1$$

Packet Day 18

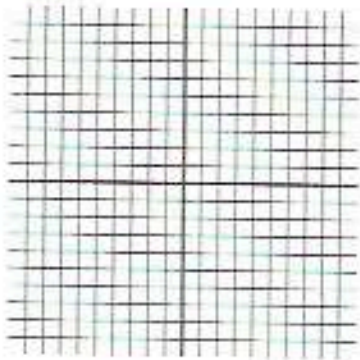
Algebra I

name:

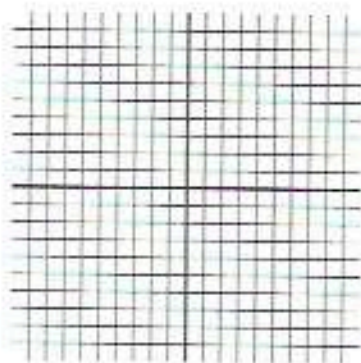
Horizontal and Vertical Lines

Graph the lines.

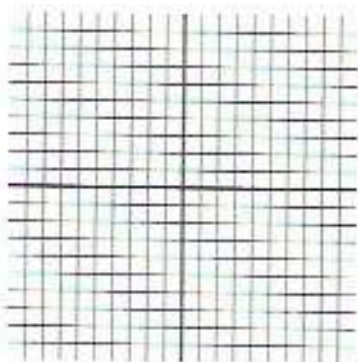
1. $y = 3$



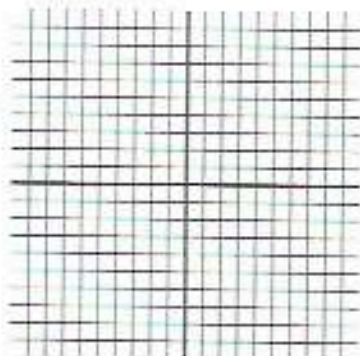
2. $x = -4$



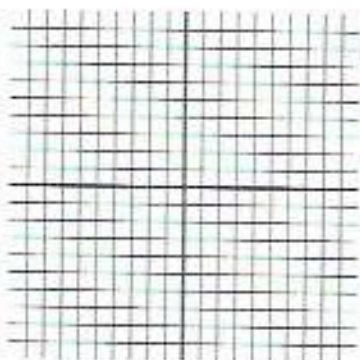
3. $x = 1$



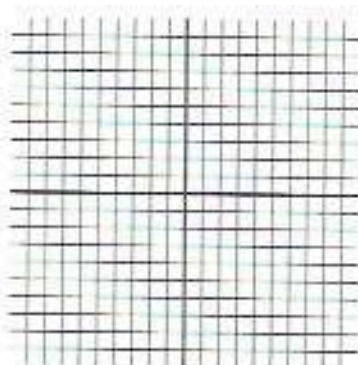
4. $y = -2$



5. $y = 0$



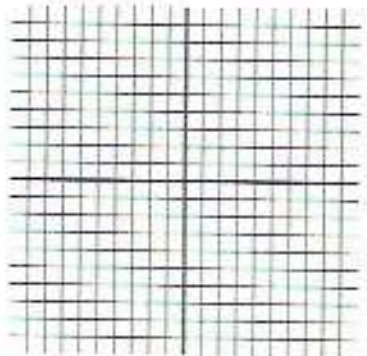
6. $x = 3$



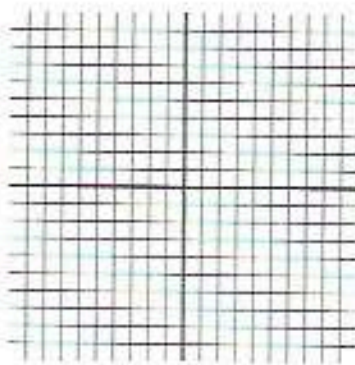
Packet Day 18

Write the equation for each line.

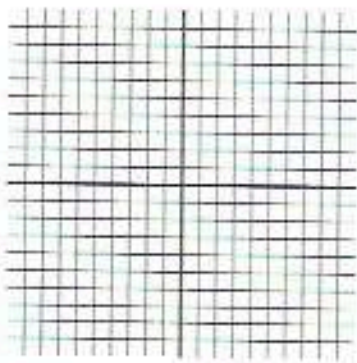
7. _____



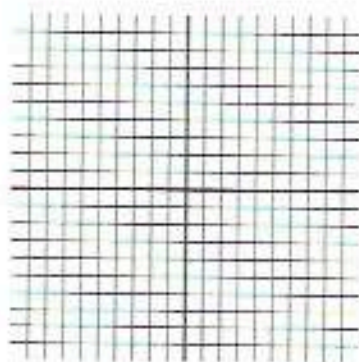
8. _____



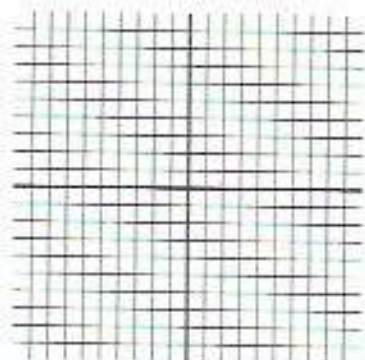
9. _____



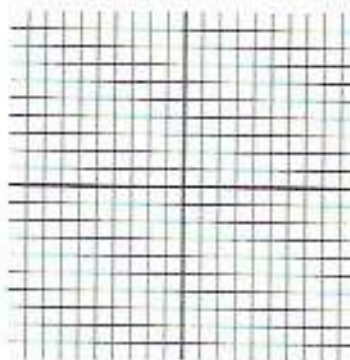
10. _____



11. _____



12. _____



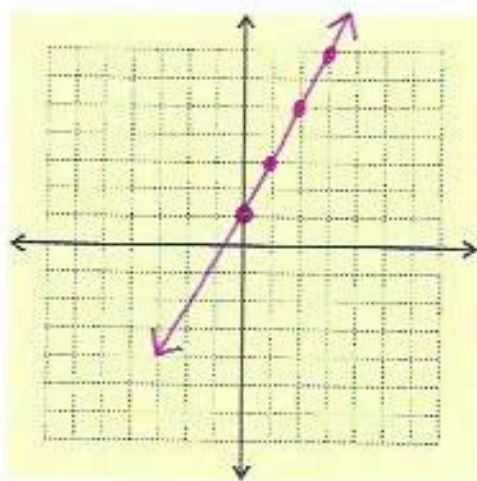
Name _____

What is slope-intercept form?

$$y = mx + b$$

 $m = \text{slope}$ $b = \text{y-intercept}$ Graphing in slope-intercept form:

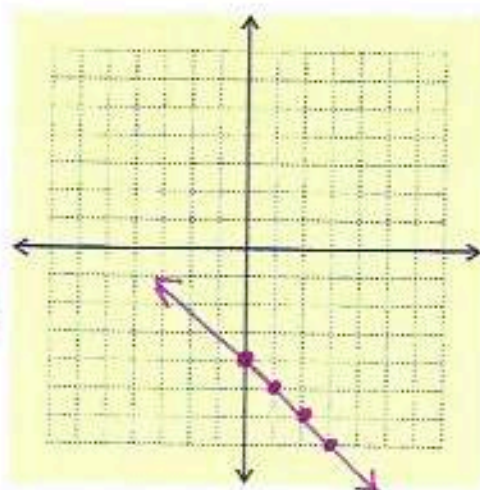
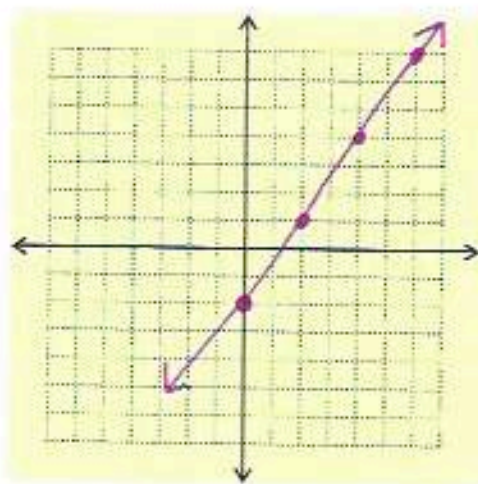
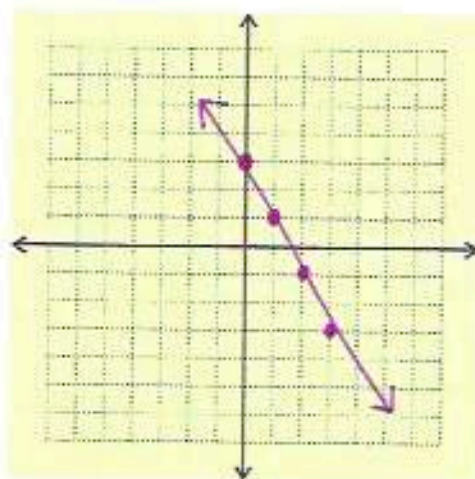
1. Plot the y-intercept (b) as a point on the y-axis.
2. Plot additional points by using the slope (m)
3. Connect the points with a line

Example 1: $y = 2x + 1$ y-intercept = 1 mark a point at 1 on the y-axisslope = $\frac{2}{1}$ $\frac{\text{rise}}{\text{run}}$ to get more points

When your slope is a whole number, put the number over 1.

Example 2: $y = -x - 4$ y-intercept = -4slope = $-\frac{1}{1}$ only the "rise" is negative

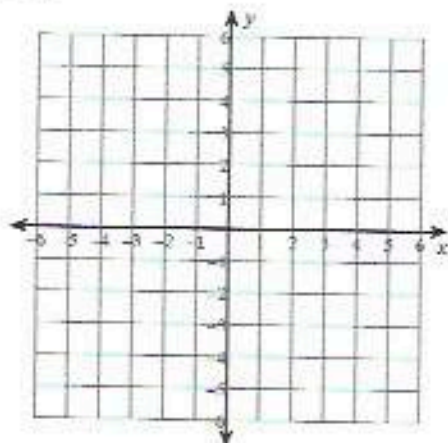
remember invisible 1

**Example 3:** $y = \frac{3}{2}x - 2$ y-intercept = -2slope = $\frac{3}{2}$ **Example 4:** $y = -2x + 3$ y-intercept = 3slope = $-\frac{2}{1}$ 

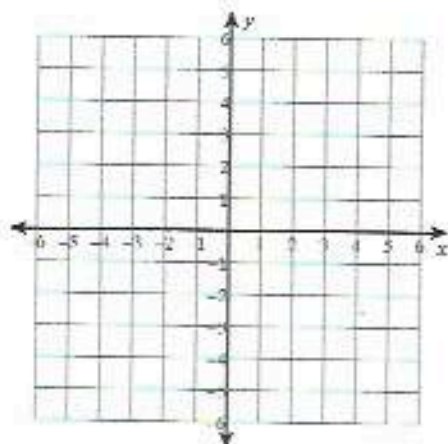
Packet Day 19

Sketch the graph of each line.

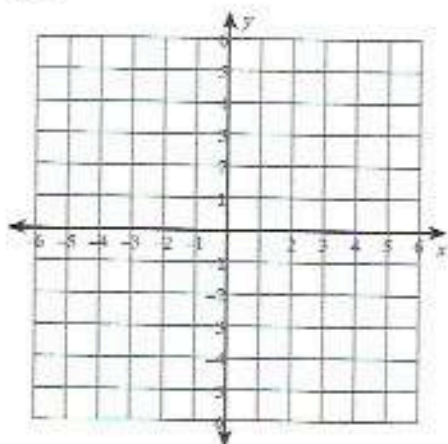
1) $y = x - 2$



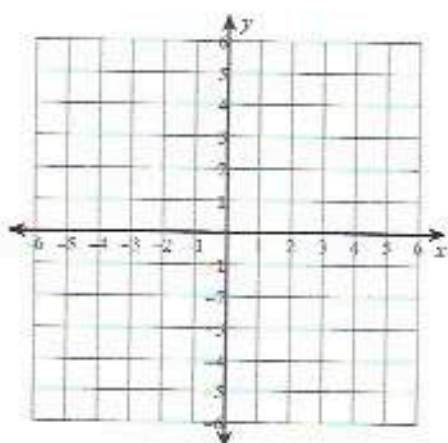
2) $y = 2x$



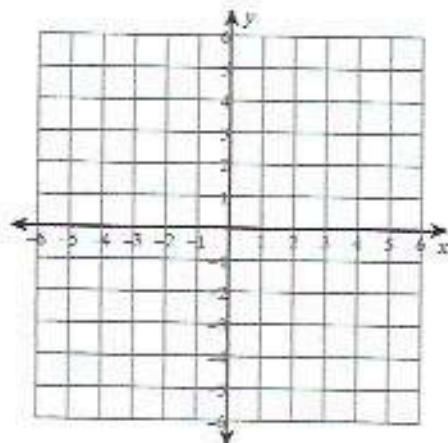
3) $y = -3x$



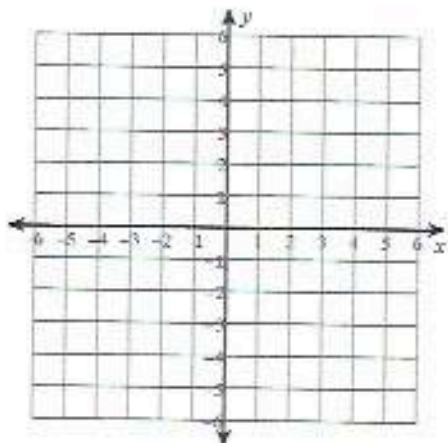
4) $y = -\frac{3}{5}x + 1$



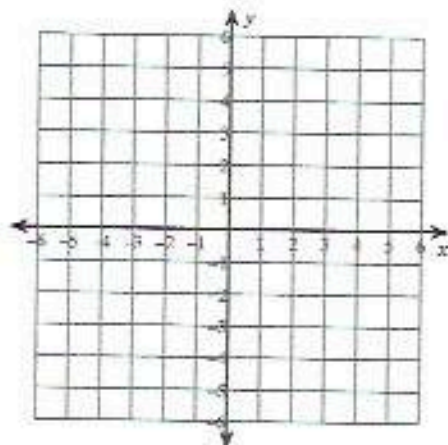
5) $y = -x - 4$



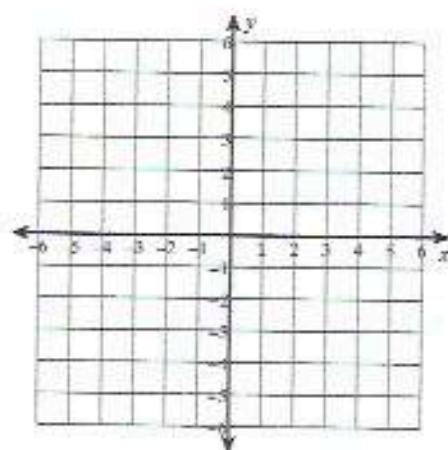
6) $y = x - 3$



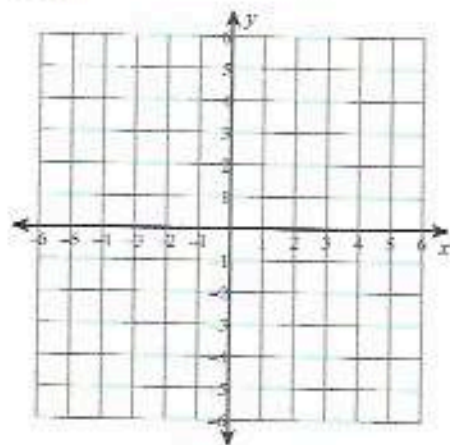
7) $y = -3x + 5$



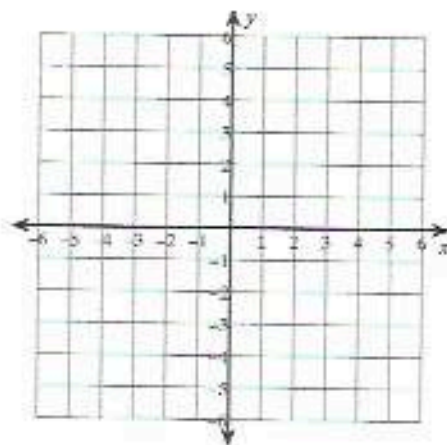
8) $y = -\frac{5}{4}x + 5$



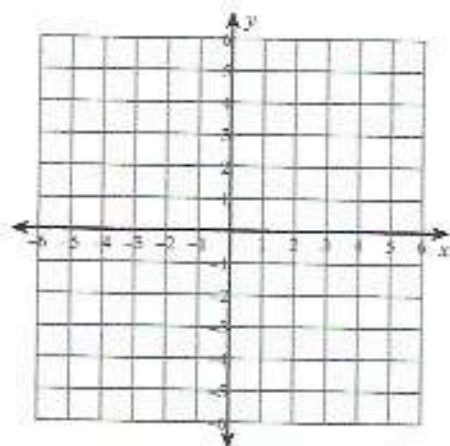
9) $y = -x - 3$



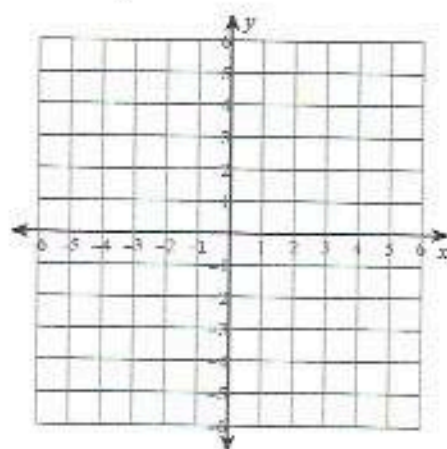
10) $y = 2x - 2$



11) $y = -4x + 1$

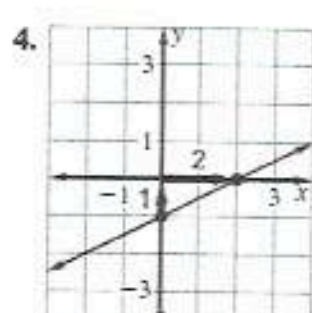
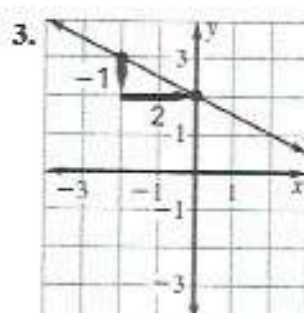
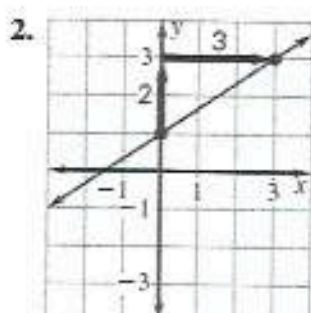
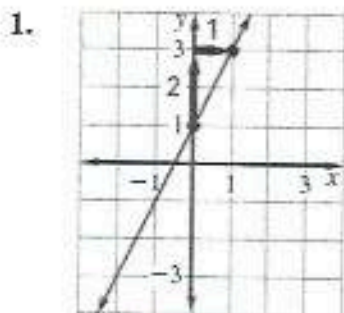


12) $y = \frac{1}{2}x - 5$



Packet Day 20

Identify the slope and y-intercept of the line whose graph is shown.

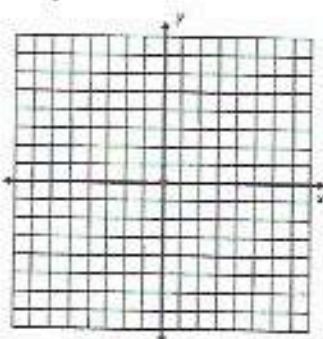


Identify the slope and y-intercept of the line with the given equation.

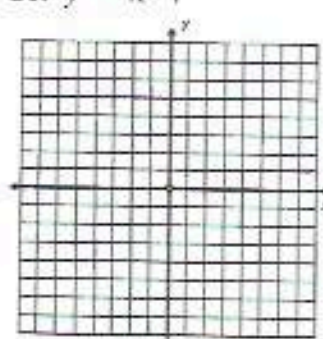
		SLOPE	y-intercept
5	$y = 3x + 4$		
6	$y = -2x + 8$		
7	$y = \frac{1}{2}x$		
8	$y = -\frac{3}{4}x - 1$		

Graph the equation.

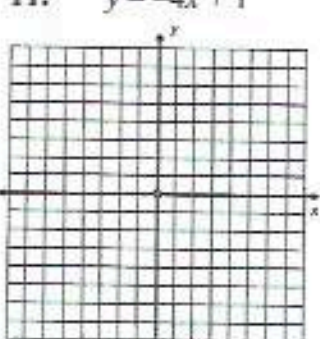
9. $y = x + 5$



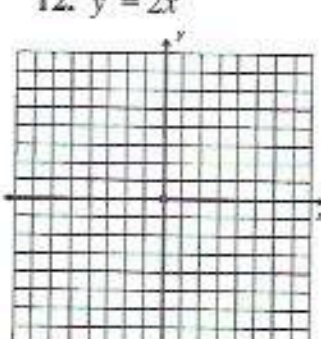
10. $y = x - 7$



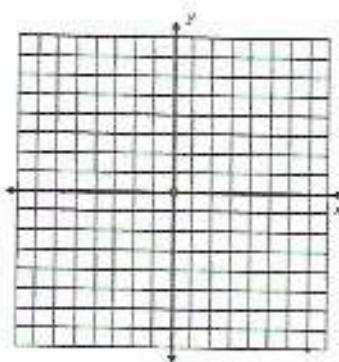
11. $y = -4x + 1$



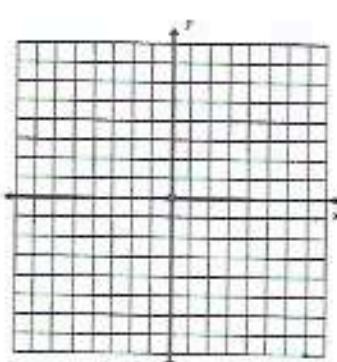
12. $y = 2x$



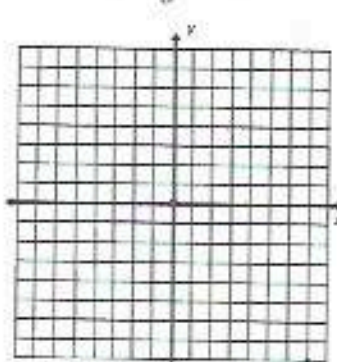
13. $y = \frac{1}{3}x + 2$



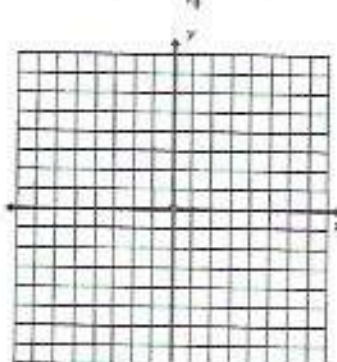
14. $y = -\frac{1}{4}x + 3$



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



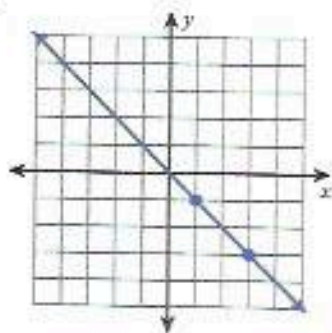
16. $y = -\frac{3}{4}x - 3$



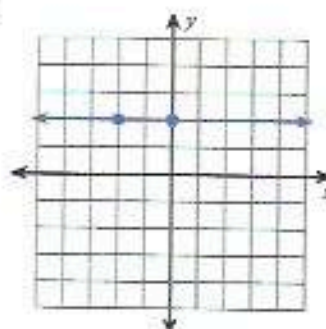
Slope and Graphs of Linear Equations

Find the slope of each line.

1)



2)



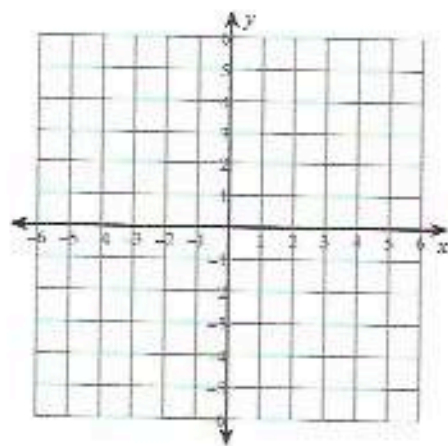
Find the slope of the line through each pair of points.

3) $(-15, 10), (-6, 16)$

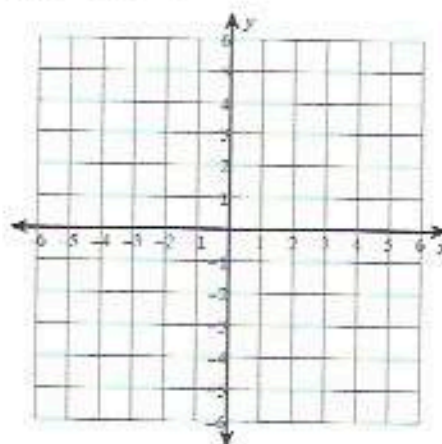
4) $(5, 7), (5, 4)$

Sketch the graph of each line.

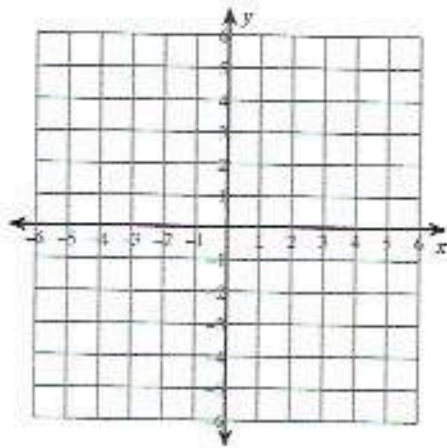
5) $y = -x - 5$



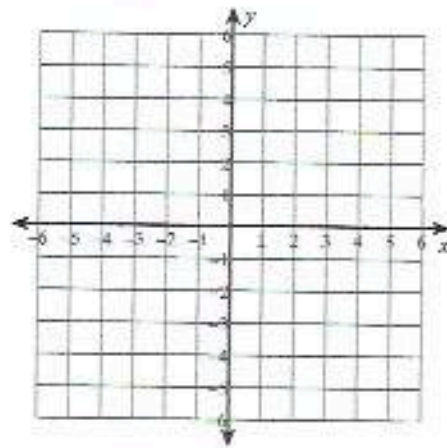
6) $y = 3x + 4$



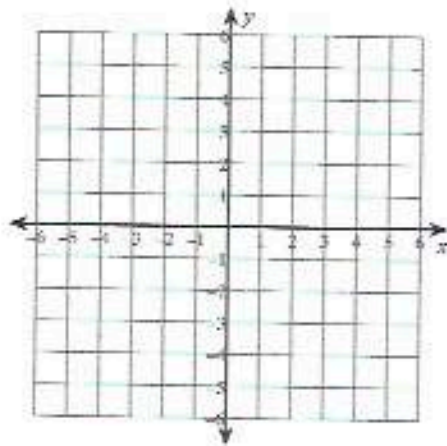
7) $2x + y = -2$



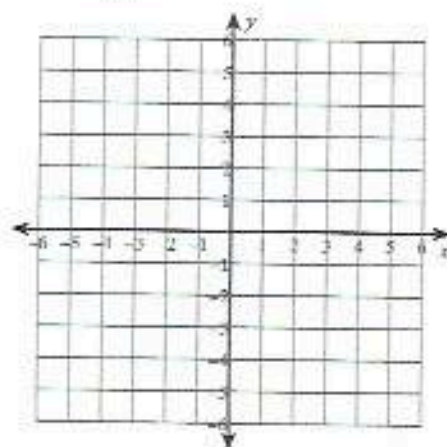
8) $x - y = 4$



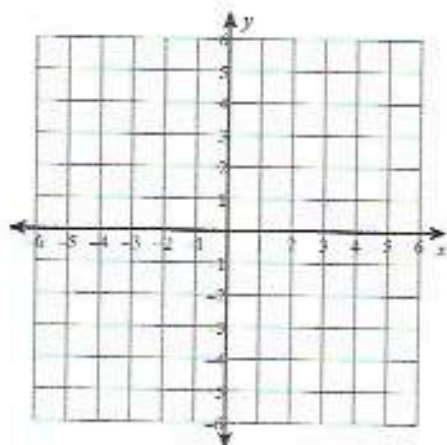
9) $y = -3x - 1$



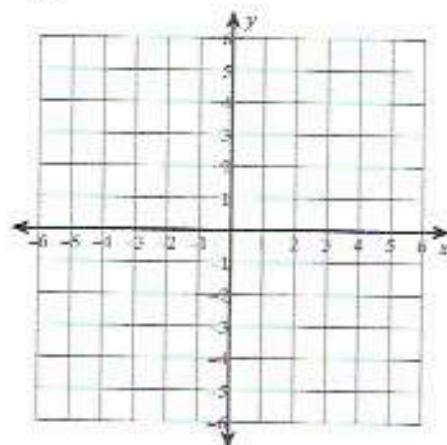
10) $y = \frac{3}{2}x - 2$



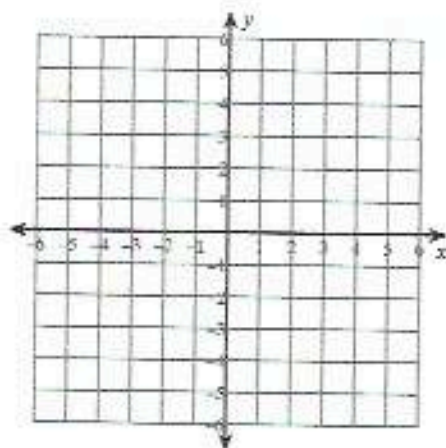
11) $y = 2x$



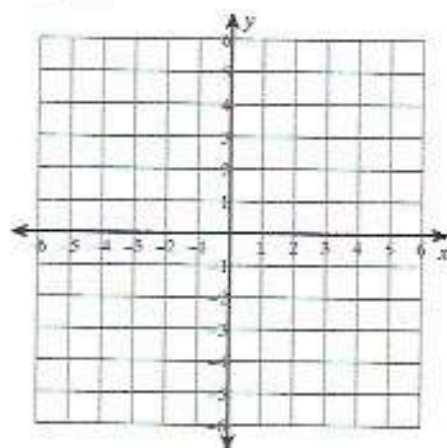
12) $y = -x + 2$



13) $x = 5$

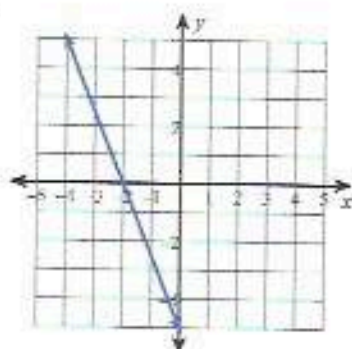


14) $y = -2$

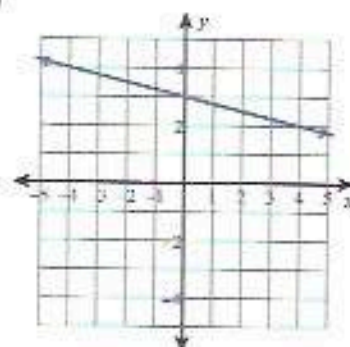


Write the slope-intercept form of the equation of each line.

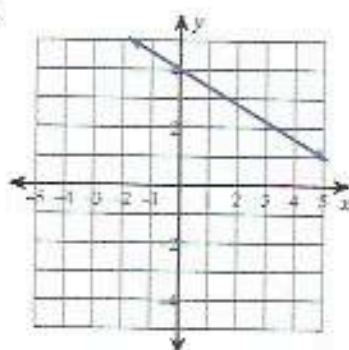
15)



16)



17)



18)

