Main Ideas/Questions	Notes/Examples
Slope-Intercept Form	Linear equations are frequently written in **slope-intercept form**: $y = mx+b$ ***m*** is the slope and ***b*** is the y-intercept

Examples

Remember Y-Intercept is the coordinate point (0, y).

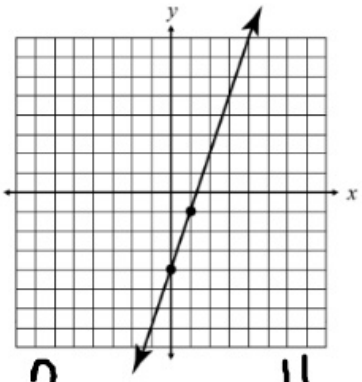
Directions: Given the slope and *y*-intercept of the line, write the equation in slope-intercept form.

1. slope = 2; *y*-intercept = -1 — $y = 2x - 1$
2. slope = $-\frac{3}{5}$; *y*-intercept = 4 — $y = -\frac{3}{5}x + 4$
3. slope = -3; *y*-intercept = 2 — $y = -3x + 2$
4. slope = -1; *y*-intercept = 7 — $y = -x + 7$
5. slope = $\frac{1}{4}$; *y*-intercept = 0 — $y = \frac{1}{4}x$
6. slope = $-\frac{5}{2}$; *y*-intercept = -3 — $y = -\frac{5}{2}x - 3$

Given a Graph

Directions: Identify the slope and y-intercept of the line on the graph. Then, write the equation of the line in slope-intercept form.

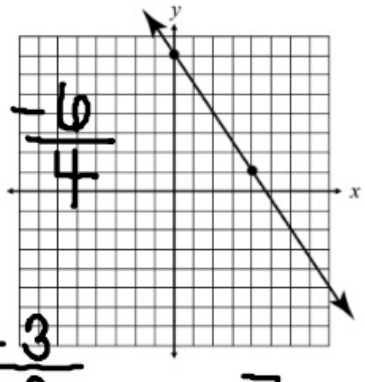
7.



$m =$ 3 $b =$ −4

Equation: $y = 3x - 4$

8.

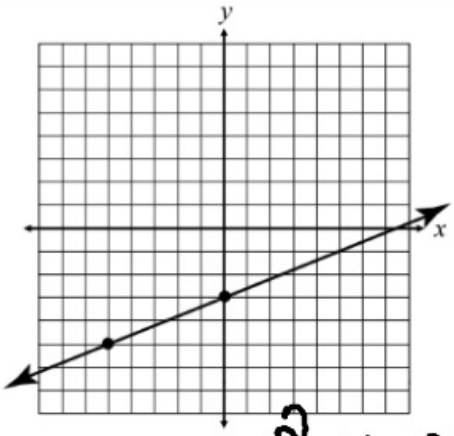


$\frac{-6}{4}$ $\frac{-3}{2}$

$m =$ $\frac{-3}{2}$ $b =$ 7

Equation: $y = \frac{-3}{2}x + 7$

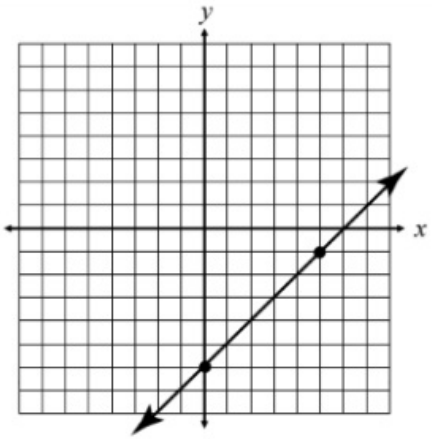
9.



Equation: $y = \frac{2}{5}x - 3$

$m = \frac{2}{5}$ $b = -3$

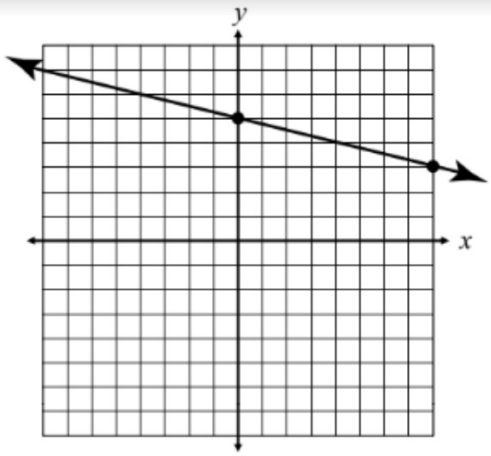
10.



Equation: $y = x - 6$

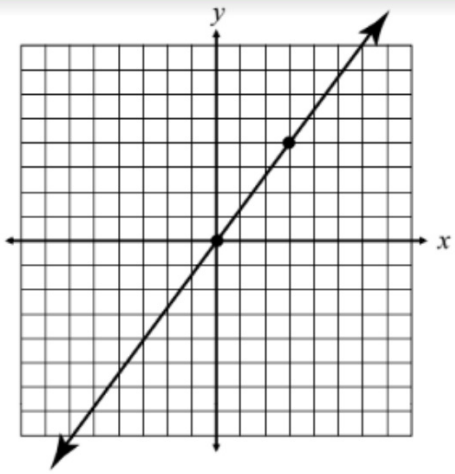
$m = 1$ $b = -6$

11.



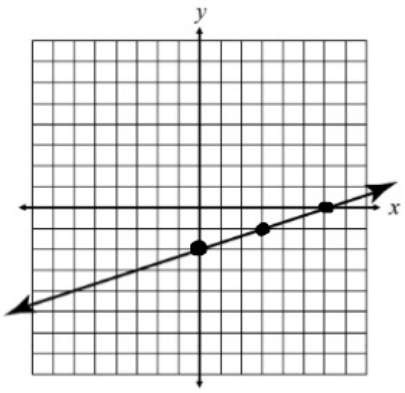
Equation: _____

12.



Equation: _____

13.



~~A. $x + 3y = -6$~~

B. $x - 3y = 6$

C. $3x + y = -2$

D. $3x - y = 2$

$m = \frac{1}{3}$

$b = -2$

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

1.) Identify the y-intercept from the graph.

2.) Identify the slope from the graph.

3.) Use the slope and y-intercept to write the equation in slope-intercept form.

4.) Convert your answer choices to y=mx+b.

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

(A) $x + 3y = -6$

$-x \quad -x$

$\frac{3y}{3} = \frac{-x}{3} - \frac{6}{3}$

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

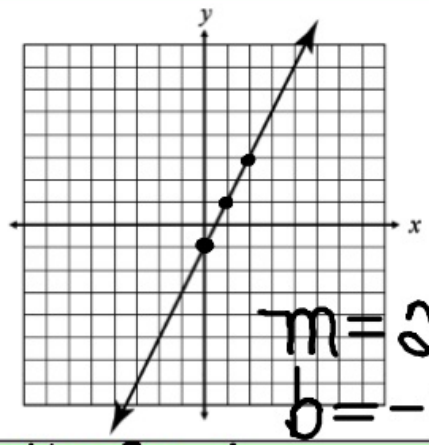
(B) $x - 3y = 6$

$-x \quad -x$

$\frac{-3y}{-3} = \frac{-x}{-3} + \frac{6}{-3}$

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

14.



$m = 2$

$b = -1$

$y = 2x - 1$

B. $x - 2y = 2$

D. $2x - y = 1$

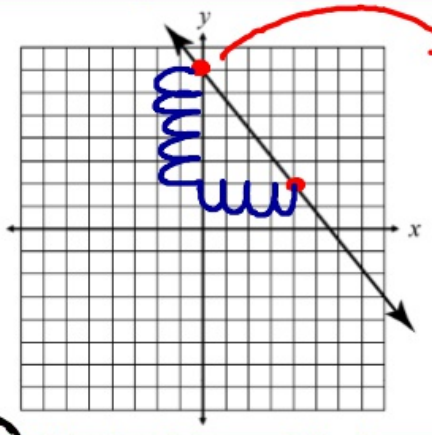
(B) $x - 2y = 2$

$-x \quad -x$

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

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

15.



$b = 7$

$m = \frac{-5}{4}$

A. $4x + 5y = 35$

C. $5x + 4y = 28$

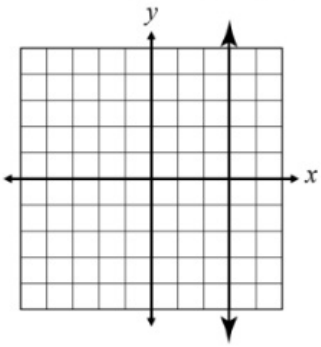
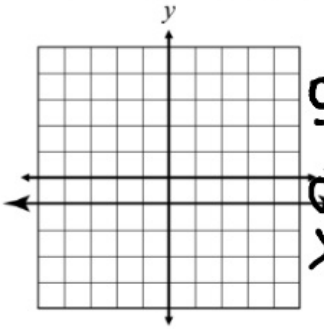
(A) $4x + 5y = 35$

$-4x \quad -4x$

$\frac{5y}{5} = \frac{-4x}{5} + \frac{35}{5}$

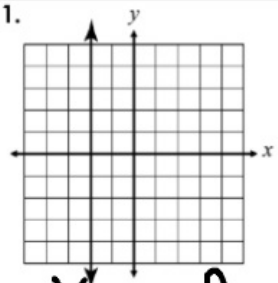
$y = \frac{-4}{5}x + 7$

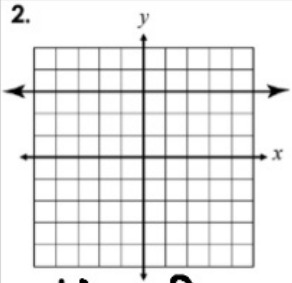
Vertical & Horizontal Lines

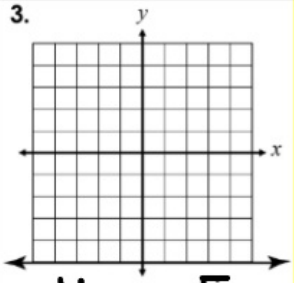
Vertical Lines	Horizontal Lines
A **vertical line** is written in the form $x = a$, where a represents the line's x-intercept.	A **horizontal line** is written in the form $y = a$, where a represents the line's y-intercept.
do not cross y-axis	does not cross x-axis
	
The equation of the vertical line graphed above is $x = 3$	The equation of the **horizontal** line graphed above is $y = -1$

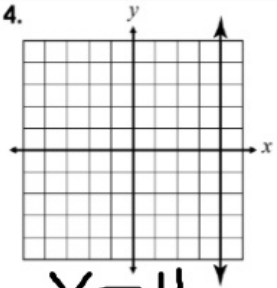
examples

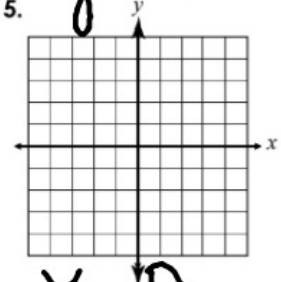
Directions: Write the equation of the line shown on the graph.

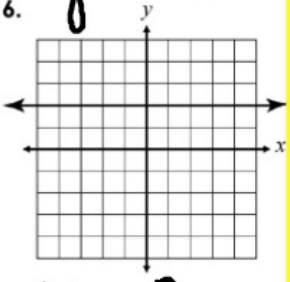
1.  $x = -2$

2.  $y = 3$

3.  $y = -5$

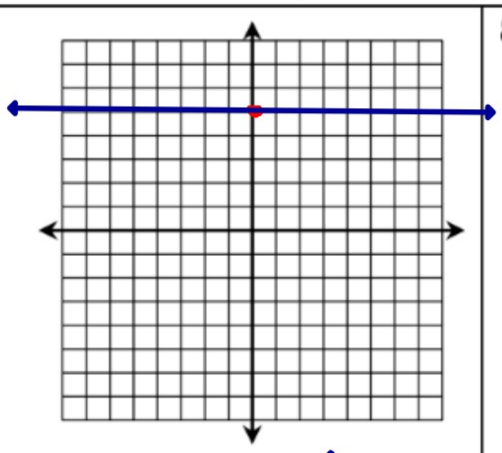
4.  $x = 4$

5.  $x = 0$

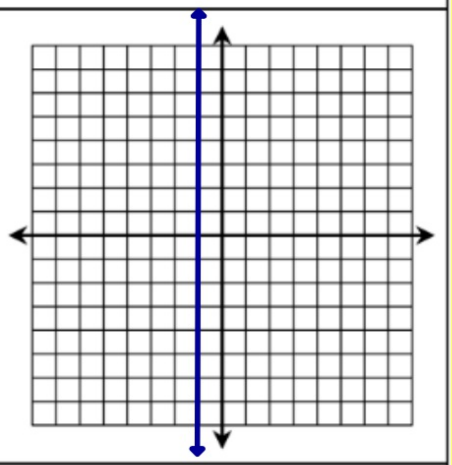
6.  $y = 2$

Directions: Graph each equation.

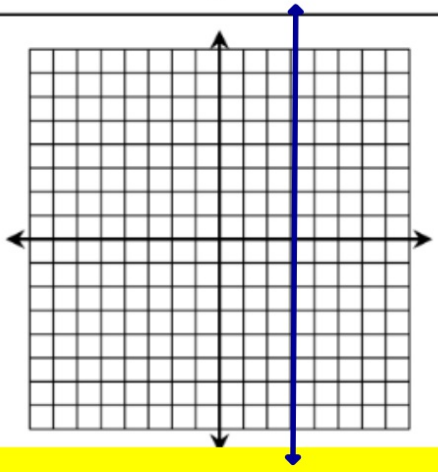
7. $y = 5$



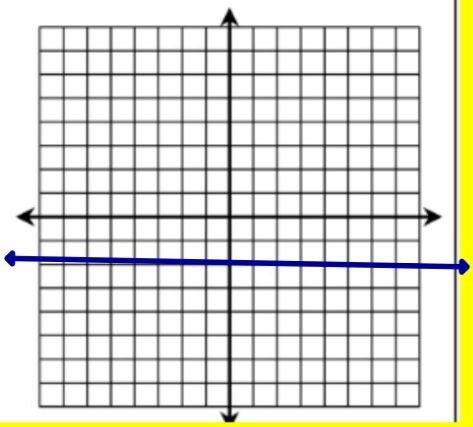
8. $x = -1$



9. $x = 3$



10. $y = -2$



Writing Linear Equations Given a Table

x	y	
−2	3	
−1	5	+2
0	7	+2
1	9	+2
2	11	+2

+1 +1 +1 +1

m= 2 b= 7

Equation: y=2x+7

x	y	
0	3	
1	5.5	+2.5
2	8	+2.5
3	10.5	+2.5
4	13	+2.5

+1 +1 +1 +1

m= 2.5 b= 3

Equation: y=2.5x+3

Just like writing an equation from a graph, you need to *identify the slope and the y-intercept.*

How do you find the y-intercept from a table?

Writing an Equation from a Table WITHOUT x=0

https://www.youtube.com/watch?v=Qo1_xkv2w_M

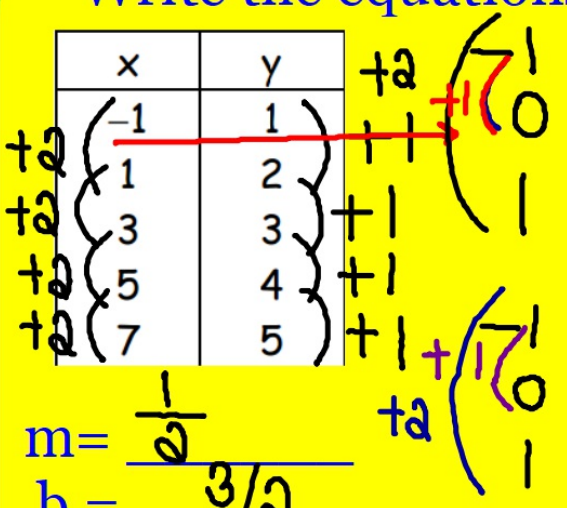
	x	y	
+1	−6	−4	
			−5
+1	−5	−9	
			−5
+1	−4	−14	
			−5
+1	−3	−19	
			−5
	−2	−24	
	−1	−29	
	0	−34	

m= −5 b = −34

Equation: y = −5x − 34

Practice:
Write the equations using the tables provided.

x	y
−1	1
1	2
3	3
5	4
7	5



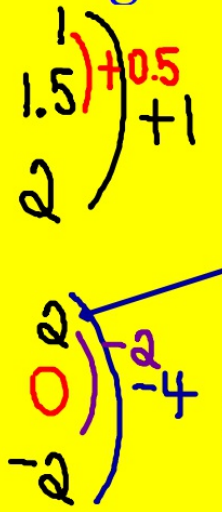
m= 1/2

b = 3/2

Equation:

y = 1/2x + 3/2

x	y
−5	10
−3	6
−1	2
1	−2
3	−6



m= −2

b = 0

Equation:

y = −2x