

Graphing Linear Functions Equations

When you graph equations, you have to be able to identify the slope and y-intercept from the equation.

Step 1: Solve for y (if necessary)

Step 2: Plot the y-intercept. (starting point)  $x=0$

Step 3: From the y-intercept, use the slope to calculate another point on the graph.

Step 4: Connect the points with a ruler or straightedge.

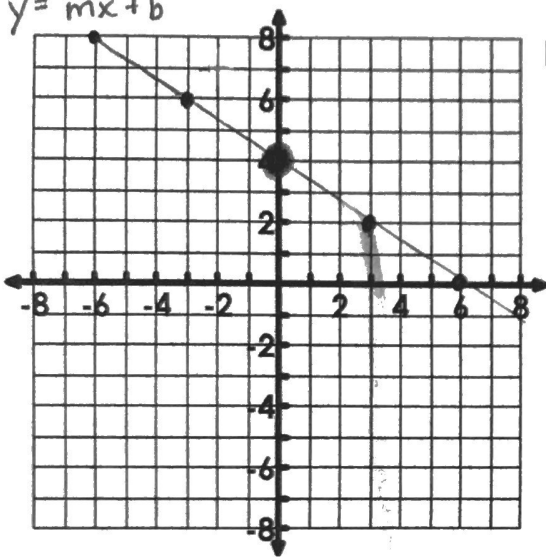
where

$$\text{Slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{+1 \quad -1}{+\rightarrow \quad -\leftarrow}$$

Ex. Graph the following lines:

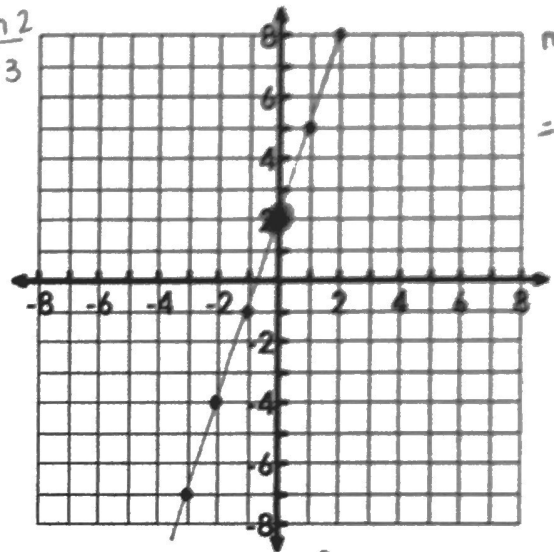
A.  $y = -\frac{2}{3}x + 4$     $m = -\frac{2}{3}$     $b = 4 \Rightarrow (0, 4)$

$y = mx + b$   
 $y = 3x + 2$     $m = 3$     $b = 2 \Rightarrow (0, 2)$



$m = -\frac{2}{3} = \frac{\text{down } 2}{\text{right } 3}$

negative slope



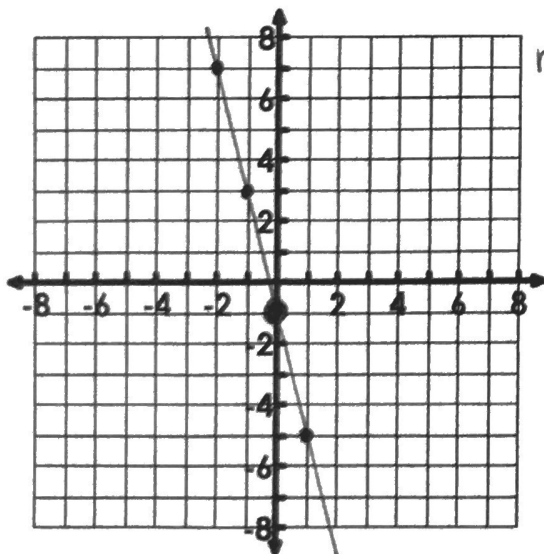
$m = \frac{3}{1}$

=  $\frac{\text{up } 3}{\text{right } 1}$

positive slope

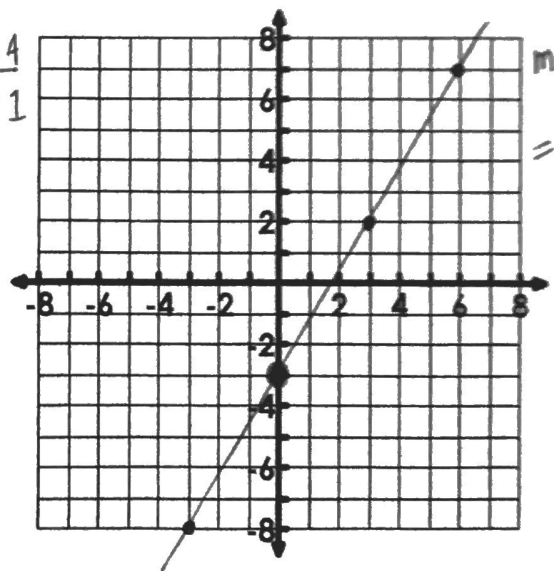
C.  $y = -4x - 1$     $m = -4$     $b = -1 \Rightarrow (0, -1)$

D.  $y = \frac{5}{3}x - 3$     $m = \frac{5}{3}$     $b = -3 \Rightarrow (0, -3)$



$m = -\frac{4}{1} = \frac{\text{down } 4}{\text{right } 1}$

negative



$m = \frac{5}{3}$

=  $\frac{\text{up } 5}{\text{right } 3}$

positive

## Graphing Horizontal and Vertical Lines

$\longleftrightarrow$   
**H**orizontal Line

$\updownarrow$   
**V**ertical Line

Zero  $\bigcirc$  Slope

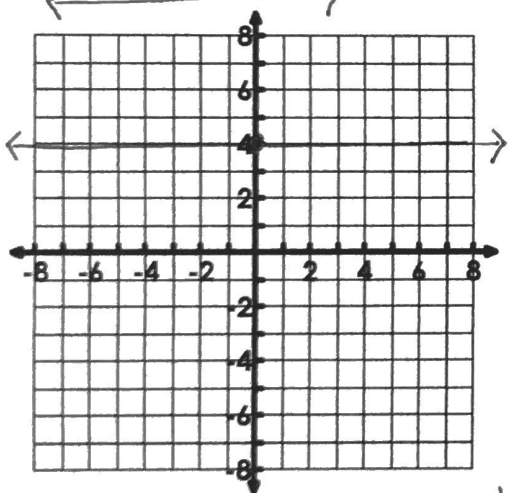
U $\infty$ ndefined Slope

**Y** =

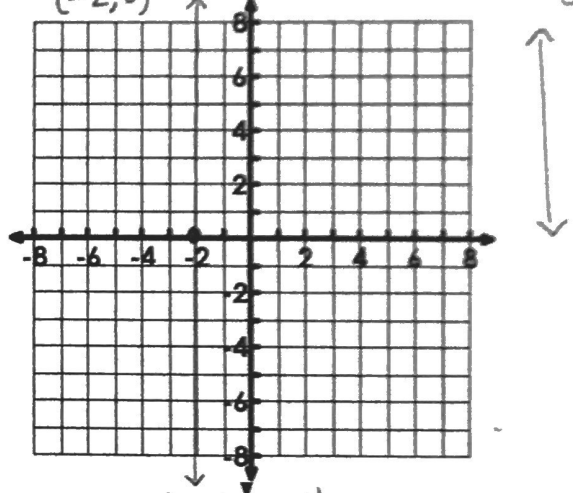
**X** =

When graphing horizontal and vertical lines, you will have one variable set equal to a constant. Whatever constant the variable is set equal to represents that value in a coordinate point. For example, if you have  $y = 2$ , all coordinate points must have a value of 2 and  $x$  can be whatever you want. Pick 3 points to graph the lines below.

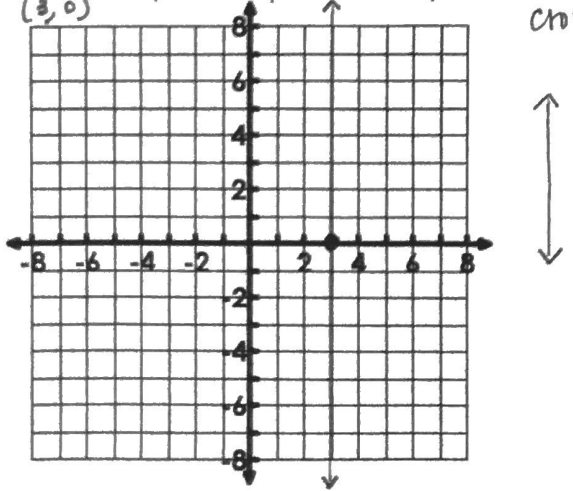
Ex.  $y = 4 \Rightarrow (0, 4)$



Ex.  $x = -2 \Rightarrow$  no  $y$ -intercept  $\Rightarrow$  does not cross  $y$



Ex.  $x = 3 \Rightarrow$  no  $y$ -intercept  $\Rightarrow$  does not cross  $y$



Ex.  $y = -5 \Rightarrow (0, -5)$

