

To graph a line when given the slope and y intercept.

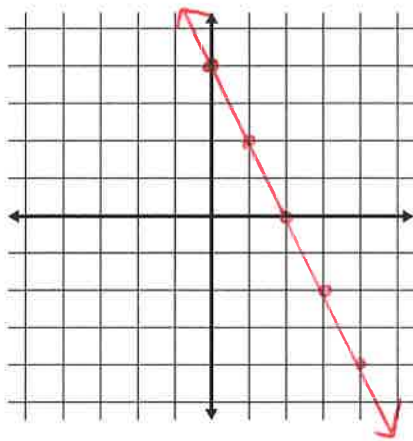
- 1.) Plot the y intercept.
- 2.) Use the slope $\left(\frac{\text{rise}}{\text{run}}\right)$ to plot at least two more points.
- 3.) Draw a line through the points.

Example 1: Graph each line with the given information.

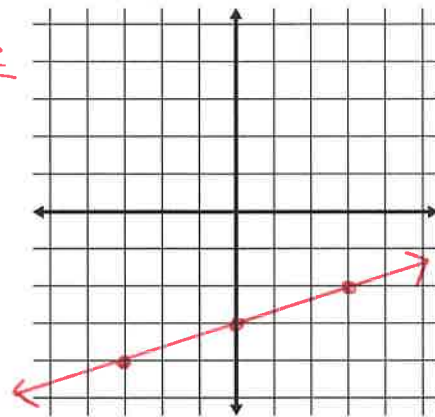
a.) slope -2 and y intercept 4.

b.) slope = $\frac{1}{3}$ and y intercept -3

b.)



$$m = -2 \frac{\text{rise}}{\text{run}}$$



$$m = \frac{1}{3} \frac{\text{rise}}{\text{run}}$$

or

$$\frac{-1}{-3} \frac{\text{rise}}{\text{run}}$$

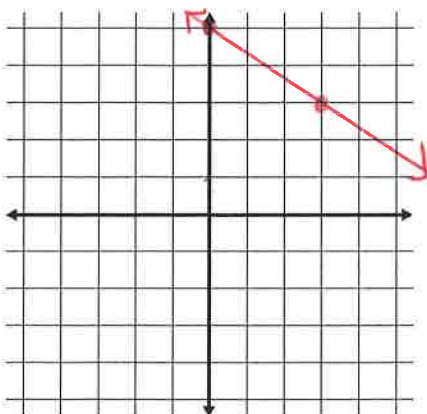
Slope-Intercept Form of a Linear Equation

If a line has slope m and the y -intercept is b , then the line is described by the equation $y = mx + b$.

Example 2: Write the equation that describes each line in slope intercept form. Then, graph the line.

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

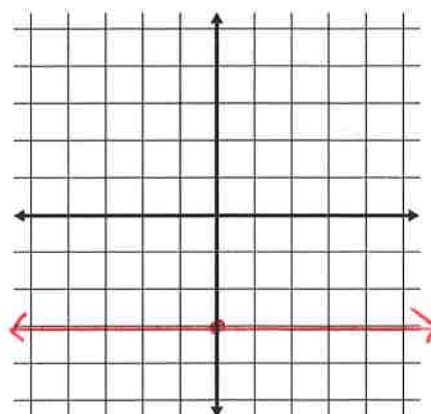
Equation: $y = -\frac{2}{3}x + 5$



$$m = -\frac{2}{3} \frac{\text{rise}}{\text{run}}$$

b.) Slope = 0 and y intercept -3

Equation: $y = -3$



$$y = 0x - 3$$

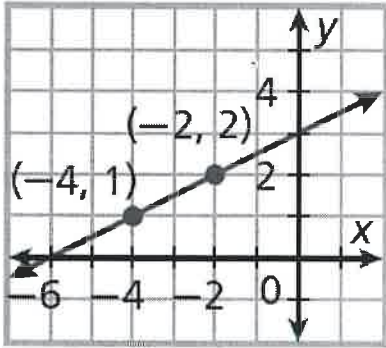
HOY

- Horizontal
- 0 slope
- $y =$

Slope-Intercept Form of a Linear Equation

If a line has slope m and the y -intercept is b , then the line is described by the equation $y = mx + b$.

Example 3: Write the equation in slope intercept form that describes the line below.



Slope: $\frac{1}{2}$

Y-intercept: 3

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

$$\frac{\text{rise}}{\text{run}} = \frac{1}{2}$$

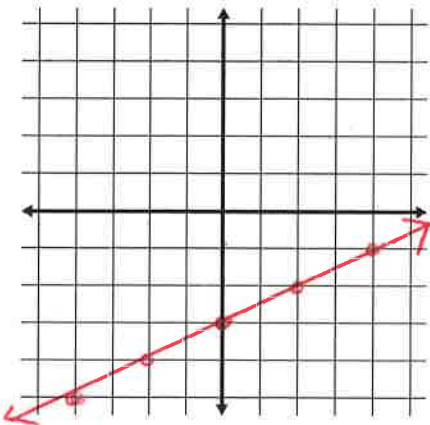
$$m = \frac{1}{2}$$

Example 4: Identify the slope and y -intercept. Then, graph each equation.

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

Slope: $\frac{1}{2}$

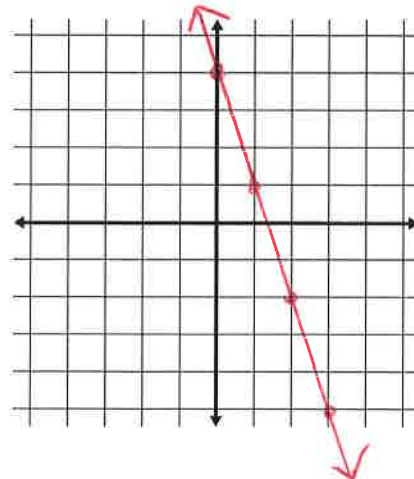
Y-intercept: -3



b.) $y = -3x + 4$

Slope: -3 or $-\frac{3}{1}$

Y-intercept: 4

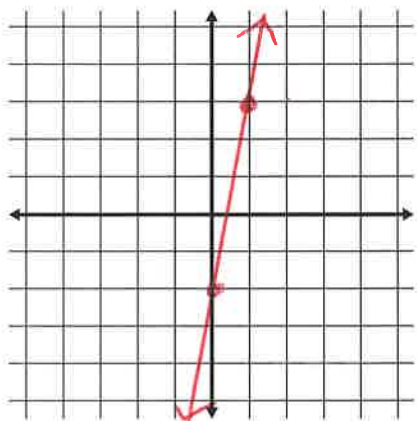


Slope-Intercept Form of a Linear Equation

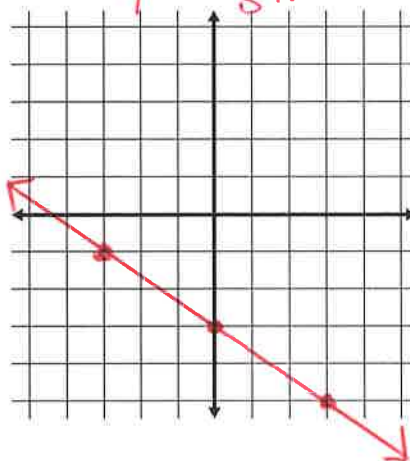
If a line has slope m and the y -intercept is b , then the line is described by the equation $y = mx + b$.

Example 5: Write each equation in slope intercept form. Then, graph the line.

a.) $-5x + y = -2$ $m = 5$ or $\frac{5}{1}$
 $\frac{+5x}{+5x} \quad \frac{+5x}{+5x}$
 $y = 5x - 2$ $b = -2$



b.) $2x + 3y = -9$ $m = -\frac{2}{3}$
 $\frac{-2x}{-2x} \quad \frac{-2x}{-2x}$
 $\frac{3y = -2x - 9}{3} \quad \frac{-2x}{3} \quad \frac{-9}{3}$
 $y = -\frac{2}{3}x - 3$ $b = -3$



example 6: Word Problem

To rent a van, a moving company charges \$30 plus \$0.50 per mile. The cost as a function of the number of miles driven is shown in the graph.

- a. Write an equation that represents the cost as a function of the number of miles.

$y = 0.50x + 30$

- b. Identify the slope and y -intercept and describe their meanings.

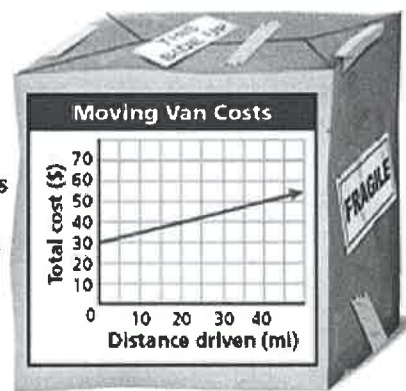
Slope: 0.50 Meaning: cost per mile

Y-int: 30 Meaning: initial charge

- c. Find the cost of the van for 150 miles.

\$105

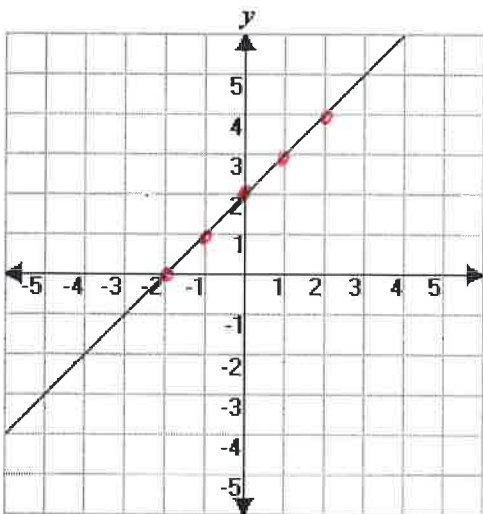
$y = 0.50(150) + 30$
 $y = 75 + 30$
 $y = 105$



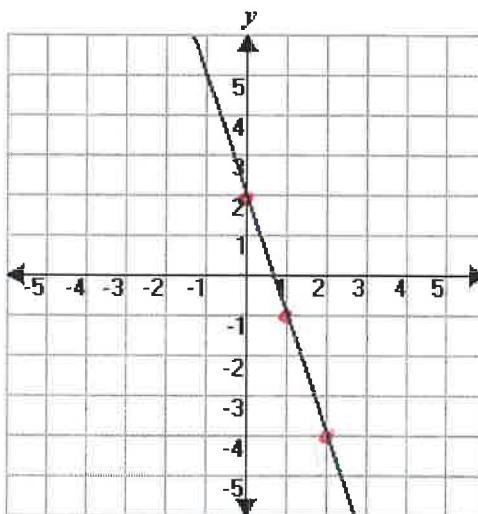
$x =$ distance
 (# of miles)

TRY IT!

1.) Write the equation of each line shown in slope intercept form.



$m = 1$
 $b = 2$



$m = -3$
 $b = 2$

Equation: $y = x + 2$

Equation: $y = -3x + 2$

2.) Write the equation in $y = mx + b$. Identify the slope and y-intercept. Then, Graph each line on the coordinate plane.

$y = 2x - 5$

$2x + 3y = 6$
 $-2x$ $-2x$

$\frac{3y}{3} = \frac{-2x+6}{3}$

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

Slope: $-\frac{2}{3}$

Y-Int: 2

$x - 5y = -15$
 $-x$ $-x$

$\frac{-5y}{-5} = \frac{-x-15}{-5}$

Equation: $y = \frac{1}{5}x + 3$

Slope: $\frac{1}{5}$

Y-Int: 3

Equation: $y = 2x - 5$

Slope: 2

Y-Int: -5

