

**Lesson1 (1-3) Graphing Linear Equations**

**Learning Objective:** I can graph linear functions using the following methods:

- a table of values
- x- and - y-intercepts
- a slope and y-intercept
- and a point and a slope.

I can find the x-&-y-intercepts of a line.

I can find the slope of a line through two points.

I can find zeros of linear functions?

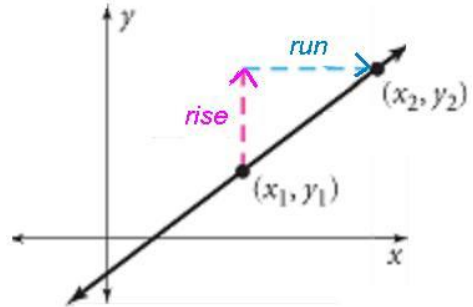
**EQ:** How many methods are there for graphing a Linear Equation? How do I graph using each method?

The Slope of a line passing through two points  $(x_1, y_1)$ ,  $(x_2, y_2)$

is

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

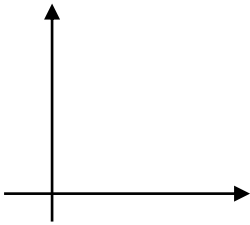
Note: slope is also called a rate of change and we tend to use the variable  $m$  to represent slope



**Ex.1. Finding Slope**

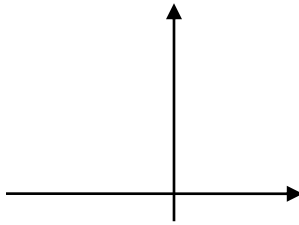
Plot the points, then find the slope of the line that passes through the points

a)  $(2, 4), (3, 6)$



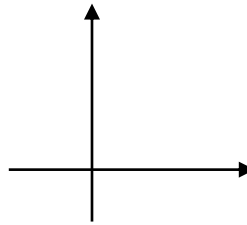
$m =$  \_\_\_\_\_

b)  $(-3, 5), (2, 1)$



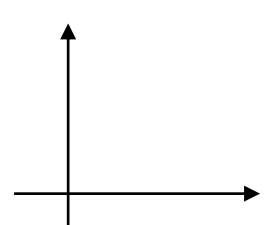
$m =$  \_\_\_\_\_

c)  $(-1, 3), (2, 3)$



$m =$  \_\_\_\_\_

d)  $(2, 3), (2, 5)$



$m =$  \_\_\_\_\_

Line is \_\_\_\_\_  
and has a \_\_\_\_\_ slope.  
The equation of the line is in the form \_\_\_\_\_

Line is \_\_\_\_\_  
and has a \_\_\_\_\_ slope.  
The equation of the line is in the form \_\_\_\_\_

Line is \_\_\_\_\_  
and has a \_\_\_\_\_ slope.  
The equation of the line is in the form \_\_\_\_\_

Line is \_\_\_\_\_  
and has a \_\_\_\_\_ slope.  
The equation of the line is in the form \_\_\_\_\_

**Short Summary #1:**

## Methods for Graphing Linear Equations/Functions:

- Using a table of  $x$  and  $y$  values
- Using the  $x$ - and  $y$ -intercepts of a line.  $(x,0)$  &  $(0,y)$
- Using the slope and  $y$ -intercept of a line.  $(y=mx + b)$

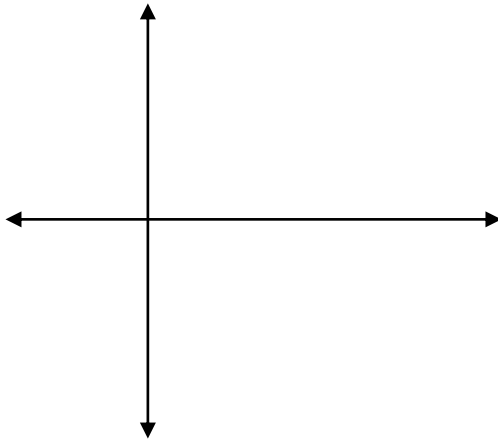
### Ex. 2: Graphing Linear Equations

Graphing a Linear Equation using a table of values.

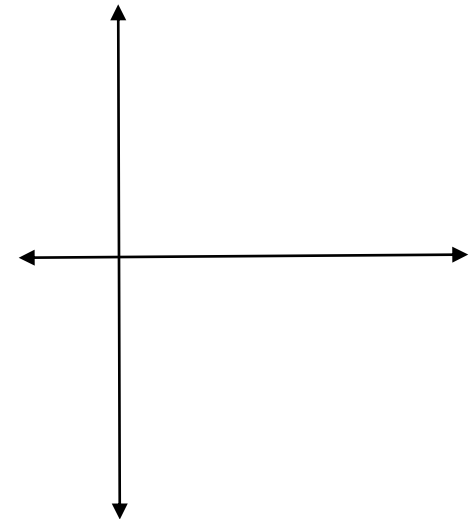
a.) Graph  $2x + y = 2$

b.) Graph  $3y + 4x = 12$

$x$	$y$

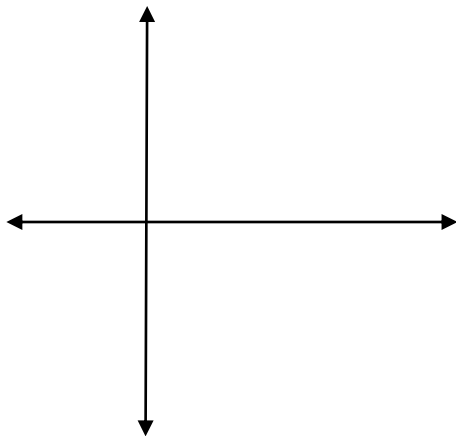


$x$	$y$



c.)  $3x - y - 2 = 0$

$x$	$y$



**Short Summary #2:**

**Ex. 3: Graphing Linear Equations using Standard form and x-&y- intercepts**

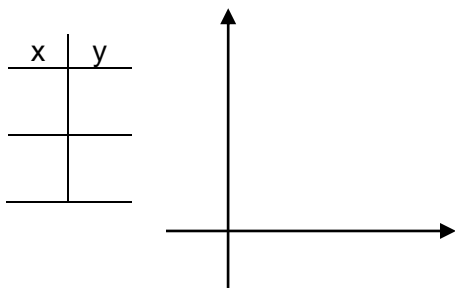
Graph using x- and y- intercepts

a.)  $6x - y - 2 = 0$

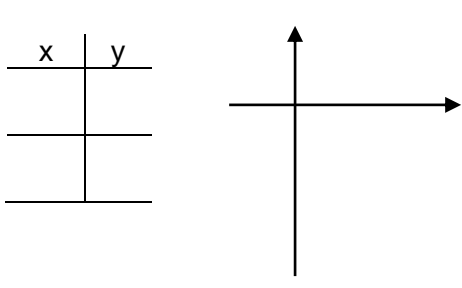
b.)  $3y + 4x = 12$

- Steps:
1. Find the x-&y intercepts of the equation.
  2. Graph both intercepts.
  3. Connect points to form a line.

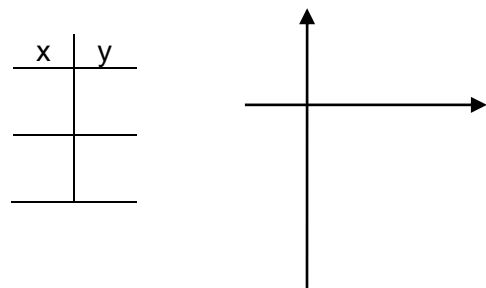
c)  $2x + 3y = 12$



d)  $3x - 4y = 9$



e)  $-4x + 2y = -8$



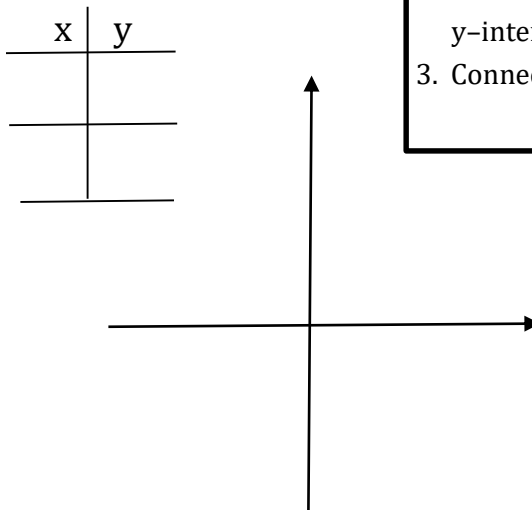
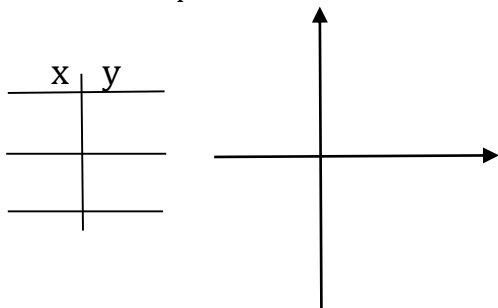
**Short Summary #3:**

**Ex. 4: Graphing Using Slope-Intercept Form**

Use the Slope Intercept Form to graph the Linear Equation

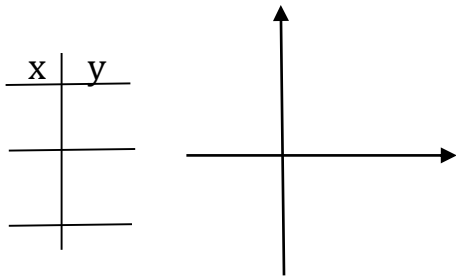
a.)  $y = \frac{3}{4}x - 2$

b.)  $y = -2x + 1$

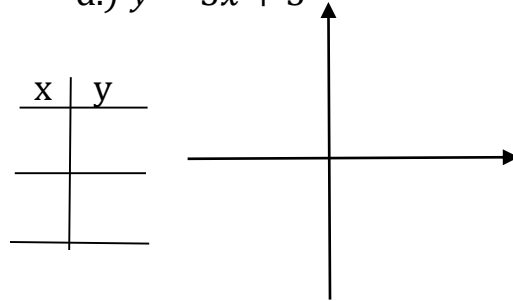


- Steps:
1. Graph the y - intercept on the y-axis.
  2. To plot the second point, count the the rise over run starting from the y-intercept you graphed in step 1.
  3. Connect the points to form a line.

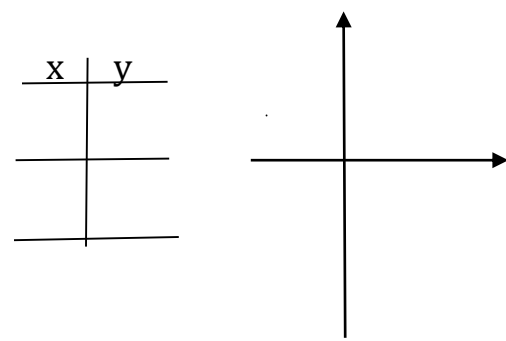
c.)  $6x + 4y = -18$



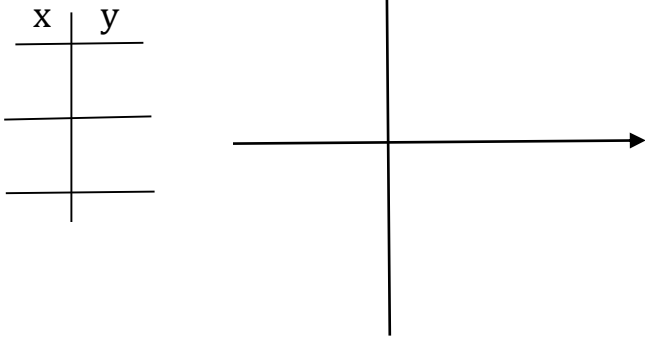
d.)  $y = 5x + 3$



e.)  $y = 3x - 2$



f.)  $3x - 2y = -4$



**Short Summary #4:**

**Ex. 5: Graphing Linear Equations When x or y is the only variable given.**

Graph the equation.

a.)  $f(x) = -3$

b.)  $x = 4$

c.)  $y = 2$

d.)  $x = -1$

e.)  $f(x) = 5$

**Short Summary #5:**

**Ex. 6: Finding the Zeros of a Function.**

Find the zeros of each linear function. If no zero exists, write *none*. Then graph the function.

a.)  $f(x) = 10x + 8$

b.)  $f(x) = -3$

c.)  $f(x) = 12x$

d.)  $f(x) = 7x - 10$

e.)  $f(x) = 10$

f.)  $f(x) = 8x - 24$

**Short Summary #6:**