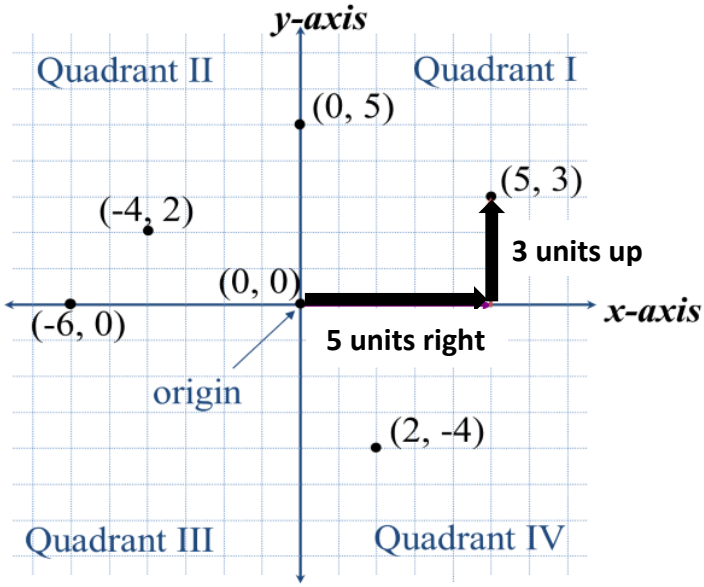
Graphing Linear Equations

Objective 1: Plotting Ordered Pairs on a Rectangular Coordinate System



Ordered pair (x, y) – two numbers associated with a point on a graph. The first number gives the horizontal location of the point. The second gives the vertical location.

***x* – axis:** horizontal number line

***y* – axis:** vertical number line

Origin: the point of intersection of the two axes

Quadrants: four regions created by the intersection of the two axes

Exercise 1: Plot each ordered pair. State in which quadrant, or on which axis the points lie. Label each point on the graph.

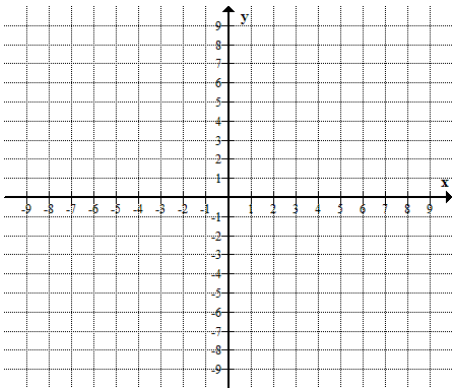
A. (3, 2) _____

B. (–4, –2) _____

C. (2, –1) _____

D. (0, 5) _____

E. (4, 0) _____



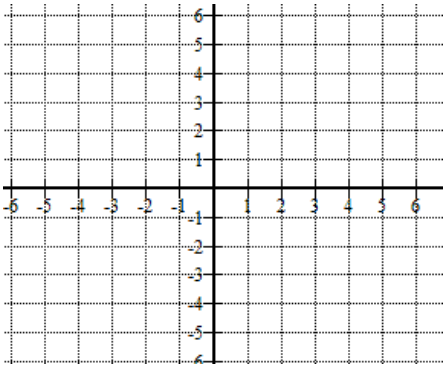
Three ways to graph a linear equation:

1. By using a table
2. By using the x-and-y intercepts
3. By using the y-intercept and use the slope to "rise and run"

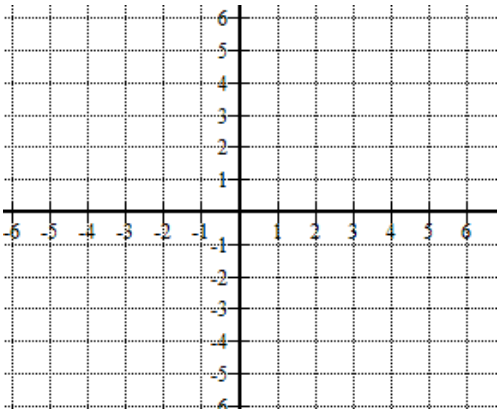
Objective 2: Graphing Linear Equations by Using Table

Example: Graph the following equations.

a. $y = 3x + 1$

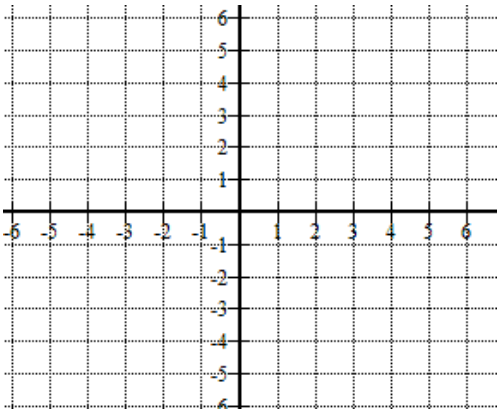


b. $y = -\frac{3}{5}x + 4$



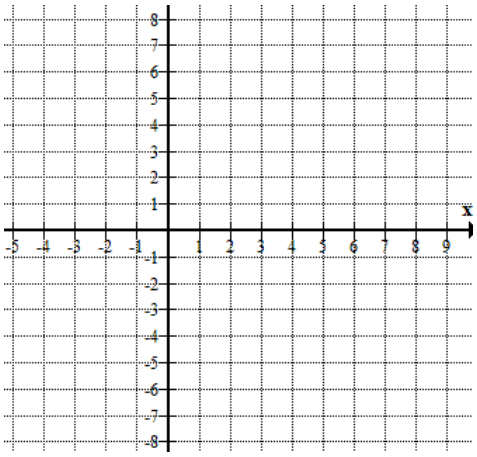
Exercise 2: Graph the following equations.

a. $y = -4x + 3$



b. $5x - 4y = 8$ Hint: Solve for y first.

x	y	Ordered pair (x, y)
0		



Objective 3: Graphing Linear Equations Using the x-and-y Intercepts

The **x-intercept** is the point at which the line crosses the _____.

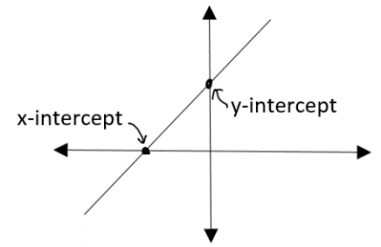
To find x-intercept, let y = _____ and solve for _____.

It is written in the form _____.

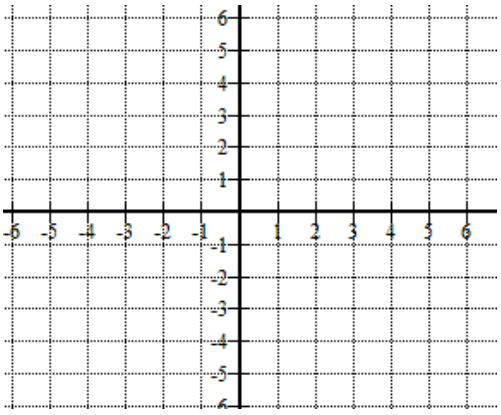
The **y-intercept** is the point at which the line crosses the _____.

To find y-intercept, let x = _____ and solve for _____.

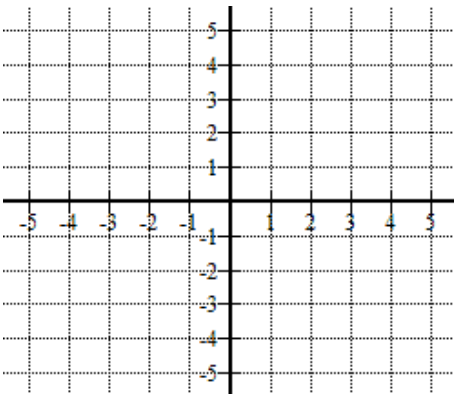
It is written in the form _____.



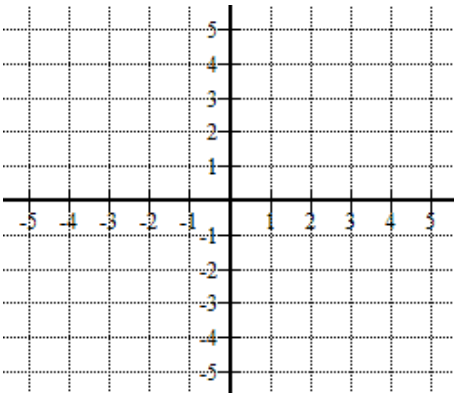
Example: Graph $5x + 10y = 10$ by using the x-and-y intercepts.



Exercise 3: Graph $2x + 4y = 12$.



Exercise 4: Graph $-x + 2y = 4$.



Objective 4: Graphing Linear Equations Using the y-intercept and the Slope

Slope-Intercept Form

The equation $y = mx + b$ has _____ as the slope and _____ as the y-intercept.

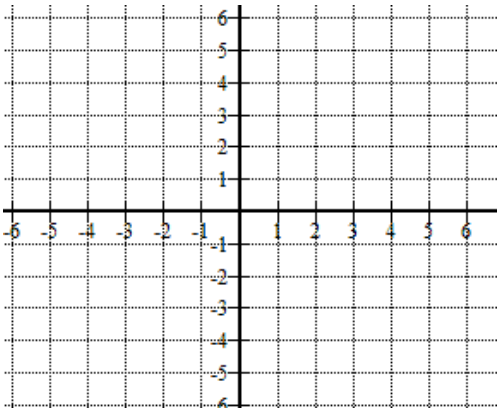
Example: Find the slope and the y-intercept of the line $3x - 6y = 12$.

Exercise 5: Find the slope and the y-intercept of the line $-3x + 5y = -15$.

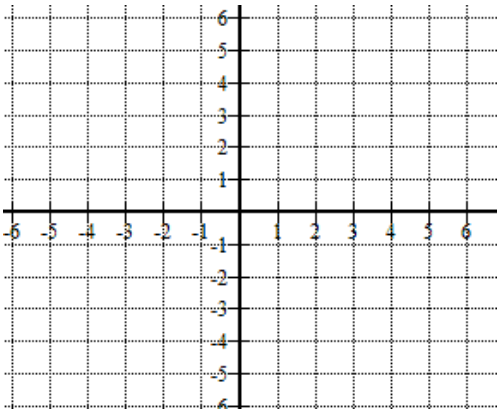
Steps to Graphing a Linear Equation Using the y-intercept and Slope

1. Plot the y-intercept.
2. From the y-intercept, rise and run however many units which the slope indicates.
   - **Positive** slope: _____ **or** _____
   - **Negative** _____ **or** _____

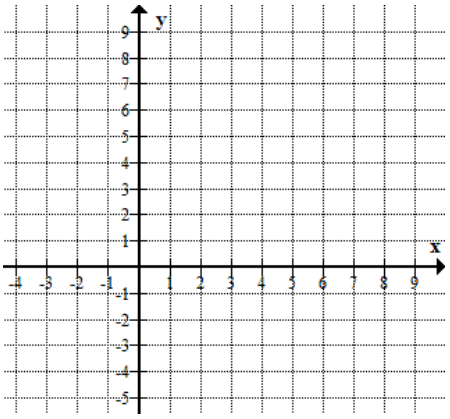
Example: Graph the equation $y = \frac{5}{3}x - 2$.



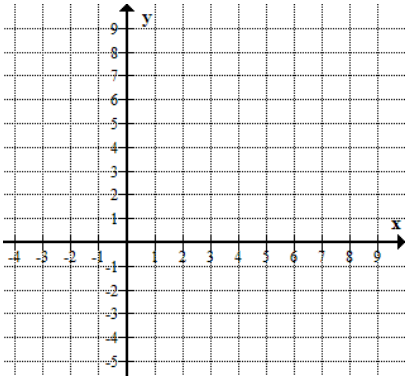
Example: Graph the equation $6x - 3y = 9$.



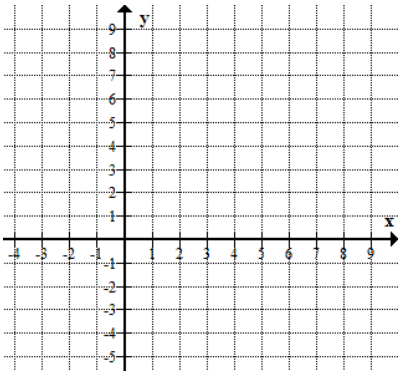
Exercise 6: Graph the equation $y = -\frac{3}{4}x + 2$



Exercise 7: Graph the equation $4x - 5y = 20$.



Exercise 8: Graph the equation $2x - 6y = -12$.



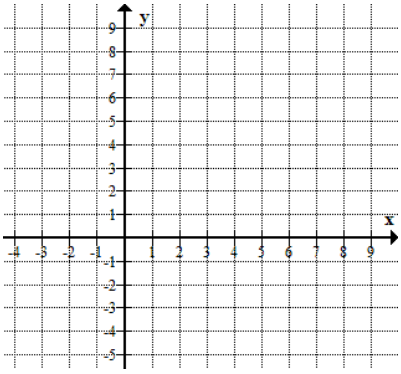
Objective 5: Graphing Horizontal and Vertical Lines

Horizontal Line
The equation of a horizontal line is in the form_____, where a is any number.

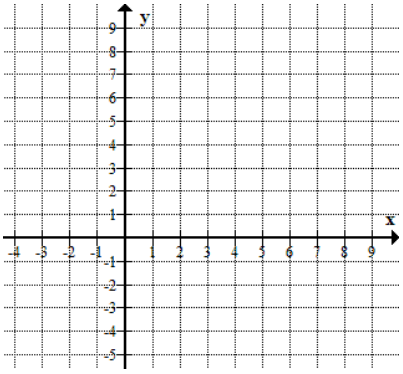
Vertical Line
The equation of a vertical line is in the form _____, where a is any number.

Example: Graph the following equations.

a. $y = 6$

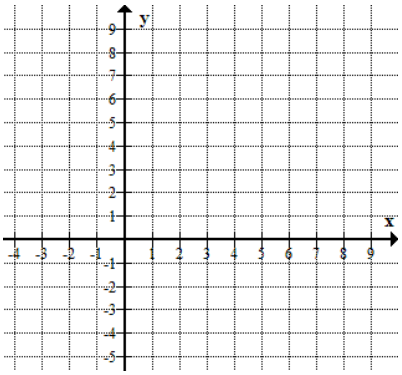


b. $x = -3$

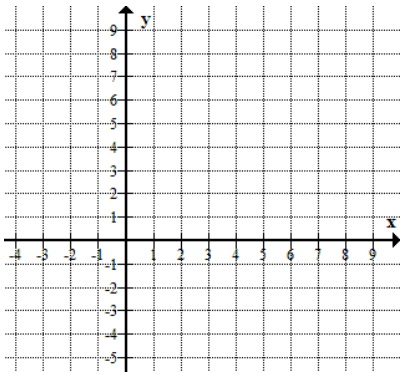


Exercise 9: Graph the following equations using any method of your choice.

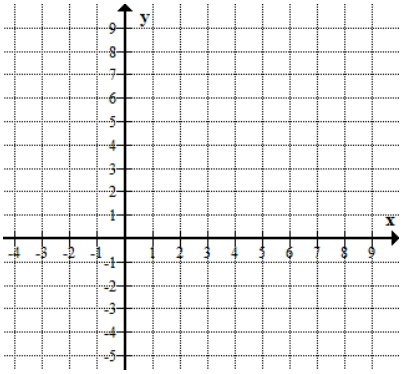
a. $y = -3$



b. $y = 2x$



c. $x = 4$



d. $2x - 4y = 8$