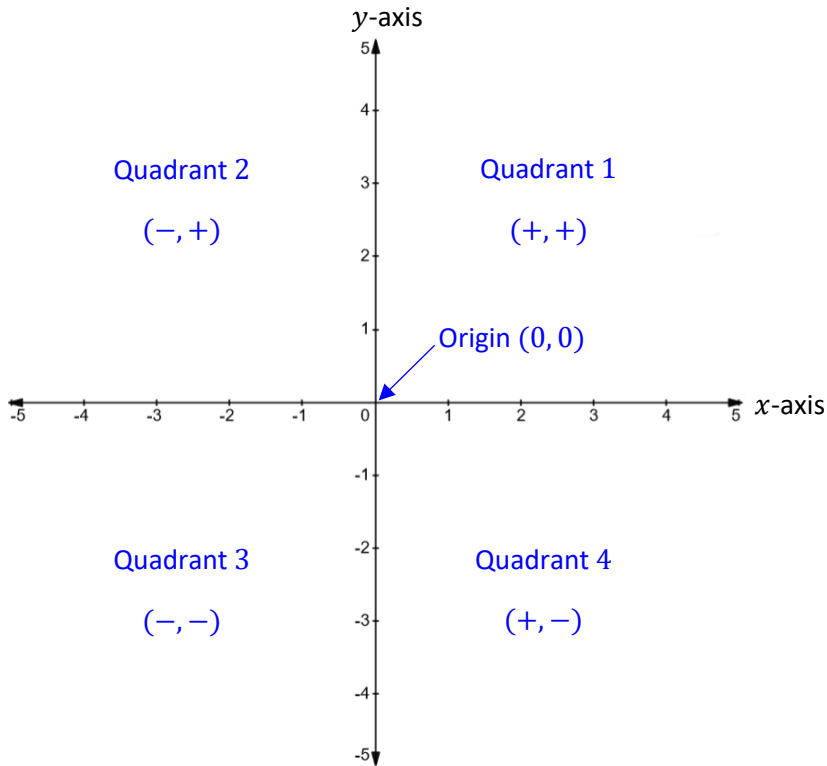# Basics of Graphing

The xy-plane is used to graph points and equations relating 2 variables:
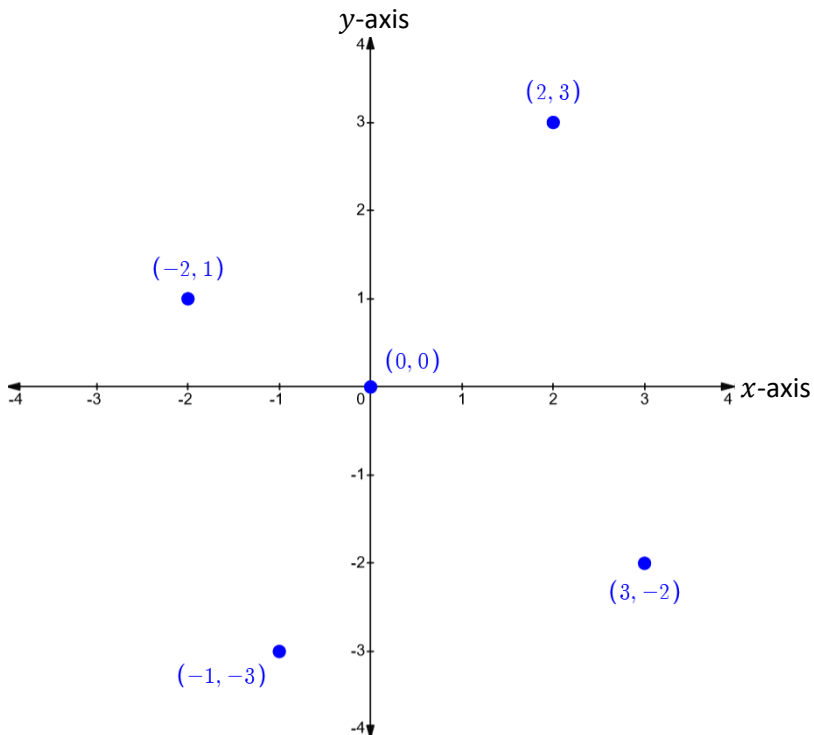**x (moving vertically left to right)** and **y (moving horizontally up and down).**

Plotting Points

Points are in the form (x, y), called ordered pairs or coordinates.

Below are some example points plotted on the graph:

Graphing Equations by Plotting Points

Example: Graph the equation $2x + 3y = 12$

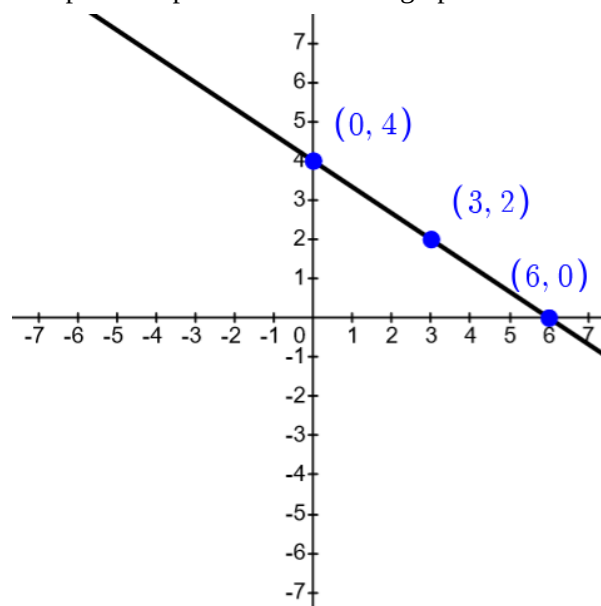Step 1: Plug in any values for x or y to get points

x	y
0	
	0
3	

$2(0) + 3y = 12 \implies y = 4$

$2x + 3(0) = 12 \implies x = 6$

$2(3) + 3y = 12 \implies y = 2$

x	y
0	4
6	0
3	2

Step 2: Plot points and connect graph

x- and y-intercepts

An x-intercept is a point $(x, 0)$, (point that intersects the x-axis) where y is zero and x is a number.
A y-intercept is a point $(0, y)$, (point that intersects the y-axis) where x is zero and y is a number.

Example: Find the x- and y-intercepts for the following equation: $2x + 3y = 12$

Step 1: Plug in zero for y to solve for the x-intercept

$\qquad 2x + 3(0) = 12 \quad \Rightarrow \quad 2x = 12 \quad \Rightarrow \quad x = 6 \qquad$ So the x-intercept is $(6, 0)$

Step 2: Plug in zero for x to solve for the y-intercept

$\qquad 2(0) + 3y = 12 \quad \Rightarrow \quad 3y = 12 \quad \Rightarrow \quad y = 4 \qquad$ So the y-intercept is $(0, 4)$

Step 3: Plot the intercepts