Graphing Definitions

The Rectangular Coordinate System is divided into 4 Quadrants by the x-axis and the y-axis. The points in this system are called ordered pairs, written as (x, y).

Midpoint Formula for the point halfway between the points (x_1, y_1) and (x_2, y_2):
$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$.

A solution to an equation in 2 variables is an ordered pair whose values make the equation a true statement. This solution set forms a line.

The **y-intercept** is where a line crosses the y-axis, (0, b).

The **x-intercept** is where a line crosses the x-axis, (a, 0).

The **slope** (m) of a line is $m = \frac{y_2 - y_1}{x_2 - x_1}$.

Two non-vertical lines are **parallel** if their slopes are equal. Vertical lines are parallel to each other.
Two lines are **perpendicular** is if the product of their slopes is -1. A vertical line is perpendicular to a horizontal line.

Equations of Lines

The **Standard Form** of the equation of a line is Ax + By = C.
The **Slope-Intercept Form** is y = mx + b, where b is the y-intercept and m is the slope.
The **Point Slope Form** is $y - y_1 = m(x - x_1)$.
Horizontal Line: y = k, where k is a constant.
Vertical Line: x = d, where d is a constant.

Steps for writing the equation of a line:

1) Find the slope if not given
2) If given the y-intercept, use the Slope Intercept Form
    a. Otherwise use the Point Slope Form
3) Use the Steps for Solving Linear Equations to set the equation in the form required.
4) Remember, Standard Form prefers A to be a positive integer.

There are 2 methods for graphing a Linear Equation.

- Method 1, you plot the points calculated from the equation.
- Method 2 use the information form the equation in Slope Intercept Form to find the points to plot, without calculating.