

Graphing a Line using Slope-Intercept Form

by Sophia



WHAT'S COVERED

This tutorial covers graphing a line using the slope-intercept form, through the definition and discussion of:

1. [Graphs and Equations: A Review](#)
2. [Slope-Intercept Form Equations](#)
3. [Graphing Slope-Intercept Form Equations](#)

1. Graphs and Equations: A Review

It's often useful to graph equations in order to visually represent the relationship between variables. To graph a line, you only need to find at least two points on the line. There are several ways to graph a line:

- Pick two values for x and find their corresponding y values to plot the points.
- Write an equation in a certain form to easily identify important information about the line.

2. Slope-Intercept Form Equations

The slope-intercept form of an equation can be used to more easily graph a line. Equations in slope-intercept form look like this:



FORMULA TO KNOW

Slope-Intercept Form of a Line

$$y = mx + b$$

This formula is called "slope-intercept form" because you can easily identify the slope and the y-intercept of the line. In this equation, the variable m represents the slope of the line.

$m = \text{slope}$



HINT

Recall that the slope of a line is its steepness. You find the slope by dividing the change in y-coordinates by the change in x-coordinates, so you can also think of slope as rise over run.

The variable b in the equation represents the y-intercept of the line. The coordinate point of the y-intercept is $(0, b)$ and the y-intercept is the location on a graph where a line or a curve intersects the y-axis.

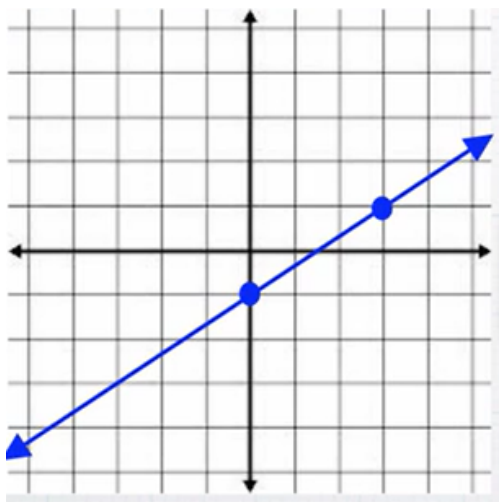
$b = y \text{ intercept}$

3. Graphing Slope-Intercept Form Equations

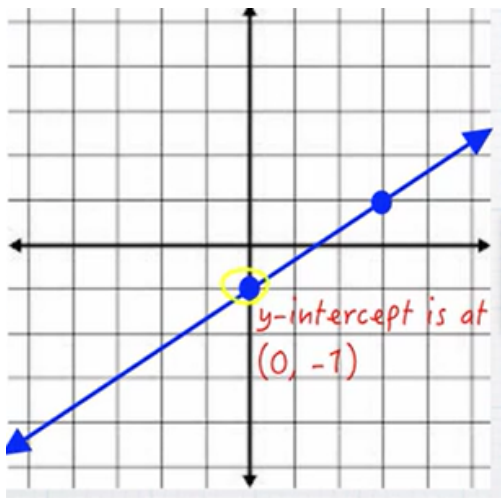
You can visually identify slope and a y-intercept on a graph.

↻ EXAMPLE Consider the equation of this graph:

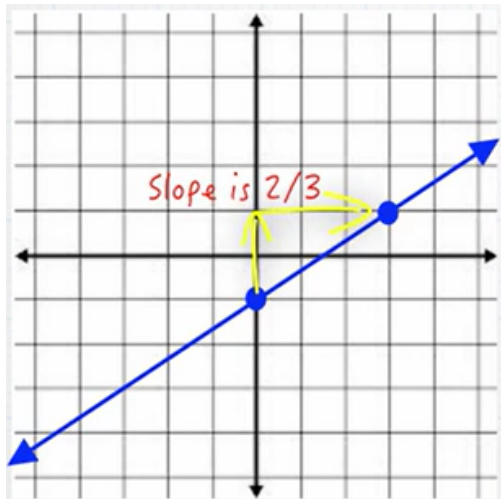
$$y = \frac{2}{3}x - 1$$



You can see that the y-intercept is -1 , which corresponds to the -1 value of b in your equation.



The slope of the line can be found by finding the rise over the run. Starting from the y-intercept, locate the next easily identifiable point on the line. From the y-intercept, you can see that you rise 2 and have a run of 3 in the positive direction. Therefore, the slope is 2 over 3, which corresponds to the m value in your equation.



You can use the variables in an equation in slope-intercept form to actually graph the equation.

⇒ EXAMPLE

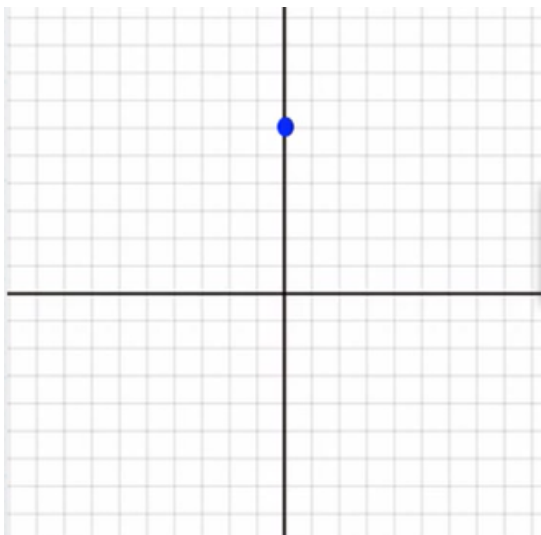


Now that you know how to graph an equation in slope-intercept form, consider the equation: $y = -3x + 6$.

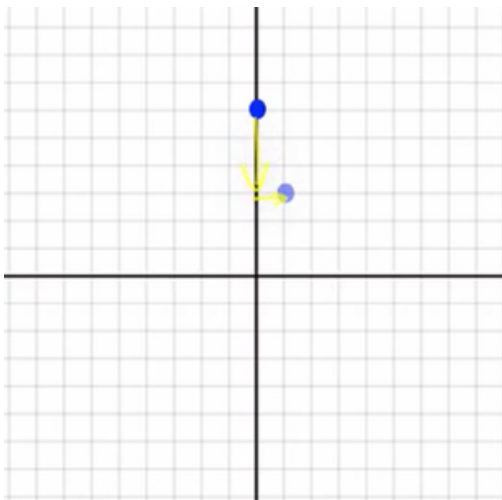
Graph this equation.



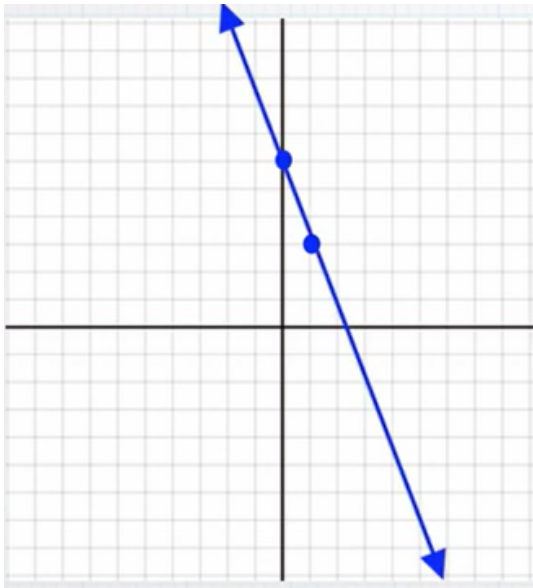
Start by identifying the y-intercept, which, again, is the b value. Therefore, the y-intercept is 6 and at the coordinate point $(0, 6)$ on the graph.



Next, referring back to your equation, look for the slope, which is the m value. The slope is -3 , which you can write as a fraction, $-3/1$, meaning that the rise is -3 and the run is 1 . Starting at your y -intercept, this means that you go down 3 and over 1 in the positive direction to find a second point.



Finally, connect the points to create a line representing the equation.



SUMMARY

Today you reviewed **graphs and equations**, noting that to graph a line, you only need to find at least two points on the line. You also learned about the **slope-intercept form**, called this because in equations that have this form, you can easily identify the slope and the y-intercept from the equation. Lastly, you learned **how to graph slope-intercept form equations**, using the easily identifiable variables representing slope and the y-intercept.

Source: This work is adapted from Sophia author Colleen Atakpu.



FORMULAS TO KNOW

Slope-Intercept Form of a Line

$$y = mx + b$$