

Graphing Linear Equations in *slope-intercept* Form (review)

If we are given the equation of a line in *slope-intercept* form:

$$y = mx + b$$

we can graph it using three basic steps:

1. Plot the y-intercept.
2. Using the slope, find a second point on the line.
3. Draw a line through the two points.

The examples below illustrate.

Example 1

Graph the line with equation:

$$y = 4x - 5$$

Step 1

Plot the y-intercept. In this example, $b = -5$ because

$$y = 4x - 5$$

$$y = 4x + (-5)$$

So, the y-intercept is $(0, -5)$.

Step 2

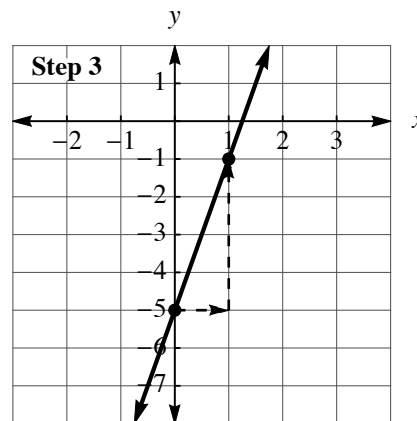
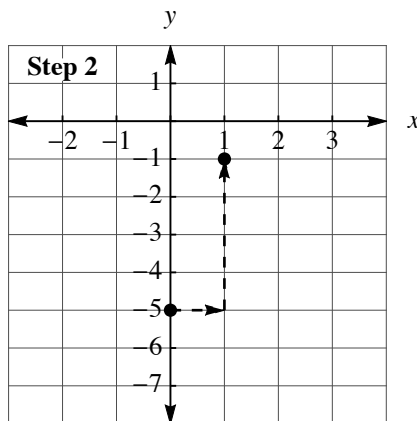
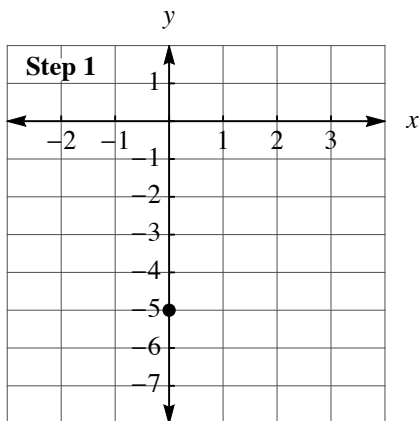
Find a second point by starting at the y-intercept and using the fact that the slope (in this example, 4) is simply the rise over the run:

$$m = \text{slope} = \frac{\text{rise}}{\text{run}} = 4 = \frac{4}{1}$$

If we go across 1 unit (run) and up 4 units (rise) we will have a second point on the line: $(1, -1)$.

Step 3

Draw a line through the two points.



Example 2

Graph the line with equation

$$y = -2x + 4$$

Step 1

Plot the y-intercept. In this example, $b = 4$ so the y-intercept is $(0, 4)$.

Step 2

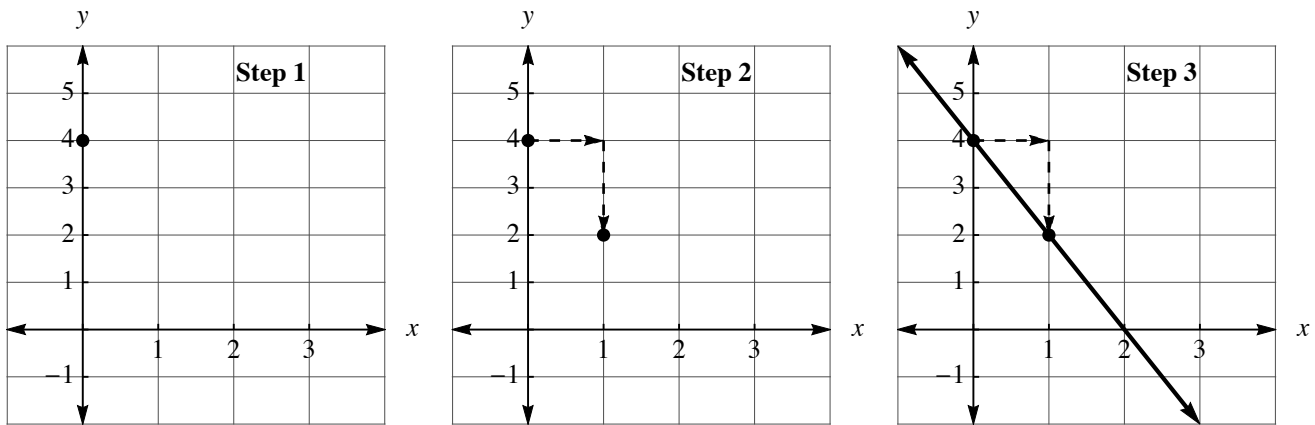
Find a second point by starting at the y-intercept and using the fact that the slope (in this example, -2) is simply the rise over the run:

$$m = \text{slope} = \frac{\text{rise}}{\text{run}} = -2 = \frac{-2}{1}$$

If we go across 1 unit (run) and *down* 2 units (rise) we will have a second point on the line: $(1, 2)$.

Step 3

Draw a line through the two points.



Example 3

Graph the line with equation

$$y = 3$$

For this equation, it is important to remember that this equation could be written as:

$$y = 0 \cdot x + 3$$

In other words, the slope is zero ($m = 0$) and $b = 3$ (it's a horizontal line!)

Step 1

Plot the y-intercept. In this example, the y-intercept is $(0, 3)$.

Step 2

Since all the y-values are 3, we can choose any other point with a y-value of 3.

Step 3

Draw a line through the two points.

