

Section 5.1 (Linear Equations and Graphs of Linear Functions)

In this section we will look at the graph of linear equations in various forms, including slope intercept form and in standard form.

The objectives for this section include:

- Understand and calculate values of slope of a line
- Given slope and y-intercept write the equation of a line
- Given an equation in slope intercept form, graph it
- Graph linear equations using the intercept method

The slope of the line through two points is defined as the difference in the y-coordinates divided by the difference in the x-coordinates. One of the ways we see slope defined is:

$$m = \frac{\Delta y}{\Delta x}$$

Find the slope of the line that passes through the given points.

1. $(3,1), (2,-7)$

2. $(-5,2), (4,-1)$

3. $(4,7), (-3,7)$

4. $(-5,8), (-5,-3)$

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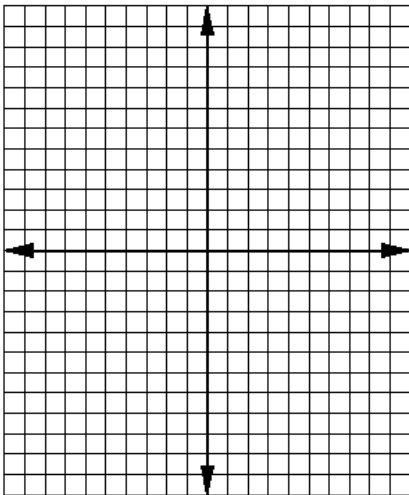
Now, let's look at how we came up with the formula for a linear equation in slope intercept form based on the definition,

$$m = \frac{y - y_1}{x - x_1}$$

Sketch the line with the given slope and y-intercept.

1.

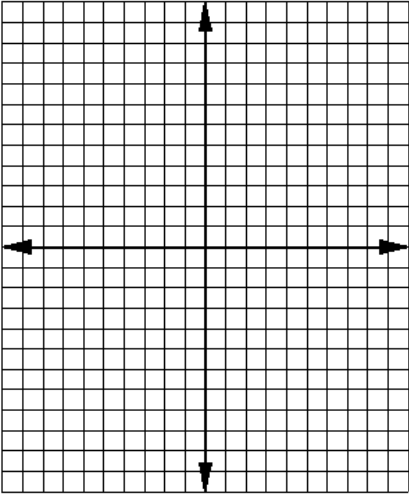
$$m = 3, (0,1)$$



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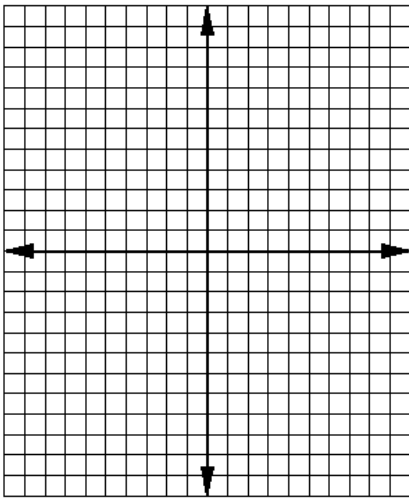
2.

$$m = \frac{2}{3}, (0, -4)$$



3. Find the slope and the y-intercept of the line with the given equation and sketch the graph using the slope and the y-intercept. A graphing calculator can be used to check your graph.

$$y = \frac{4}{5}x + 2$$



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4. Find the slope and the y-intercept of the line with the given equation and sketch the graph using the slope and the y-intercept. A graphing calculator can be used to check your graph.

$$2x + 3y = -9$$

