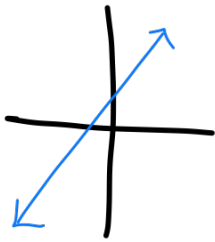
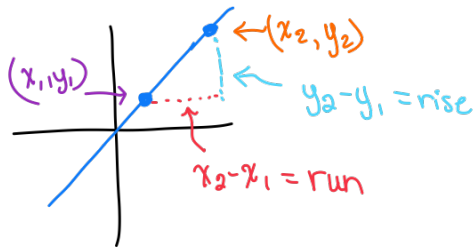
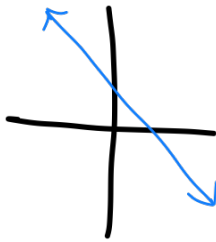


Intro to College Math: Chapter 3.4
Slope

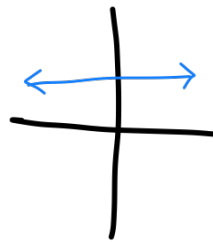
* Slope of the line through (x_1, y_1) and (x_2, y_2) is $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$



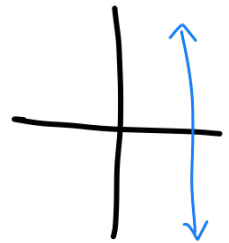
Positive slope
(line slants upward
left to right)



negative slope
(line slants
downward
left to right)



Zero slope
(horizontal
line)



undefined slope
(vertical
line)

1. Use the slope formula to find the slope of the line between the two points.

$$\begin{matrix} (1, 3) & , & (5, 0) \\ x_1, y_1 & & x_2, y_2 \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \leftarrow \text{slope formula}$$

$$m = \frac{0 - 3}{5 - 1}$$

$$m = \boxed{\frac{-3}{4}}$$

- Label one set of points x_1, y_1
- Label the other set of points x_2, y_2
- Then use the formula + replace each letter with the number that goes with it.
- Then use calculator to solve.

2. Use the slope formula to find the slope of the line between the two points.

$$\begin{array}{cc} (3, -3) & (4, -5) \\ x_1 \ y_1 & x_2 \ y_2 \end{array}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \leftarrow \text{slope formula}$$

$$m = \frac{-5 - (-3)}{4 - 3}$$

$$m = \boxed{-2}$$

- Label one set of points x_1, y_1
- Label the other set of points x_2, y_2
- Then use the formula + replace each letter with the number that goes with it.
- Then use calculator to solve.

3. Find the slope of the line through the following pair of points and draw the line through the points.

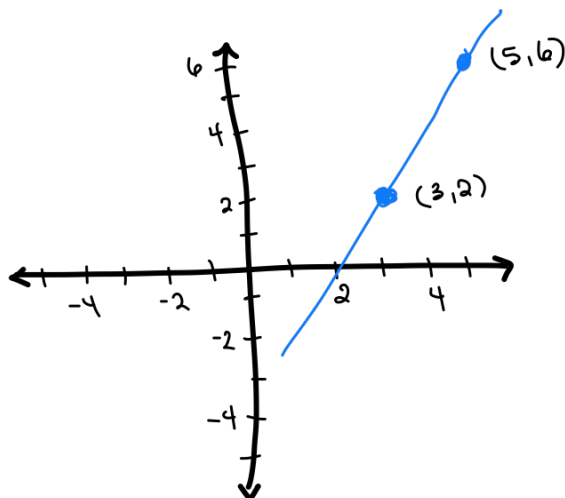
$$\begin{array}{cc} (3, 2) & (5, 6) \\ x_1 \ y_1 & x_2 \ y_2 \end{array}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \leftarrow \text{slope formula}$$

$$m = \frac{6 - 2}{5 - 3}$$

$$m = \boxed{2}$$

- Label one set of points x_1, y_1
- Label the other set of points x_2, y_2
- Then use the formula + replace each letter with the number that goes with it.
- Then use calculator to solve.



Graph both points:

- 1st number tells you to go left (if negative) and right (if positive)
- 2nd number tells you to go up (if positive) + down (if negative)

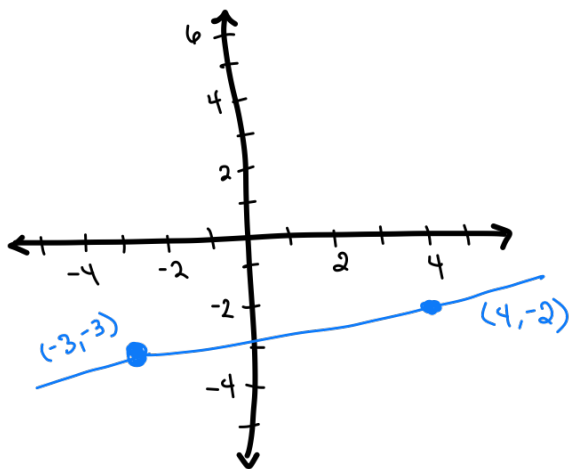
4. Find the slope of the line through the following pair of points and draw the line through the points.

$$\begin{matrix} (4, -2) & , & (-3, -3) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \leftarrow \text{slope formula}$$

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

$$m = \boxed{\frac{1}{7}}$$

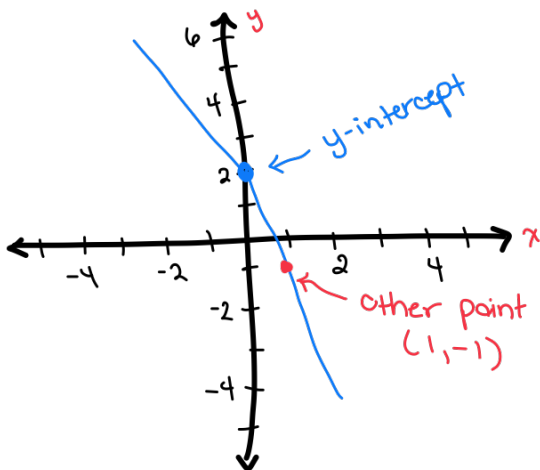


- Label one set of points x_1, y_1
- Label the other set of points x_2, y_2
- Then use the formula + replace each letter with the number that goes with it.
- Then use calculator to solve.

Graph both points:

- 1st number tells you to go left (if negative) and right (if positive)
- 2nd number tells you to go up (if positive) + down (if negative)

5. Find the slope and the y-intercept for the line.



$$\text{y-intercept} = \boxed{(0, 2)}$$

$$\text{slope} = \boxed{-3}$$

To find y-intercept:

- * Find the point on the graph where it crosses the y axis.

To find slope:

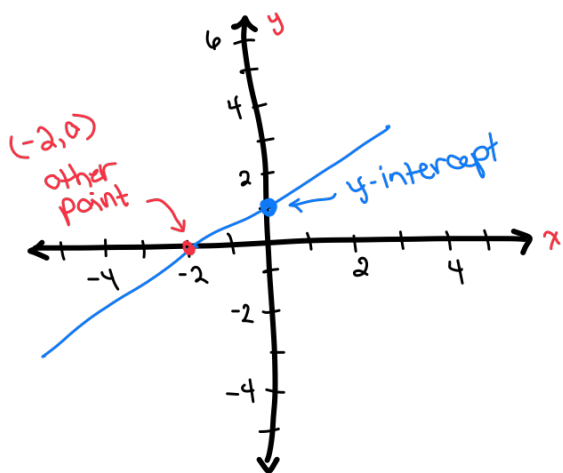
- * You will select 2 points on the graph.
- * the y-intercept can be one and then chose another.
- * Then use the slope formula to find the slope.

$$\begin{matrix} (0, 2) & (1, -1) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \leftarrow \text{slope formula}$$

$$m = \frac{-1 - 2}{1 - 0} = -3$$

6. Find the slope and the y-intercept for the line.



$$\text{y-intercept} = (0, 1)$$

$$\text{slope} = \frac{1}{2}$$

To find y-intercept:

* Find the point on the graph where it crosses the y axis.

To find slope:

* You will select 2 points on the graph.

* the y-intercept can be one and then chose another.

* Then use the slope formula to find the slope.

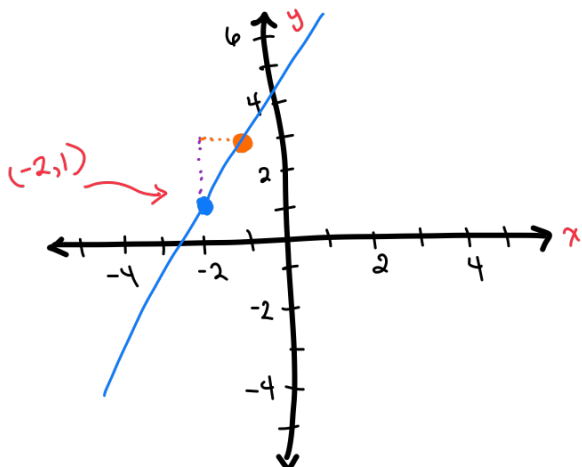
$$\begin{matrix} (0, 1) & (-2, 0) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \leftarrow \text{slope formula}$$

$$m = \frac{0 - 1}{-2 - 0} = \frac{1}{2}$$

7. Graph the line given a point and the slope.

$$(-2, 1) ; m = 2$$



* First graph the point given.

* The 1st number tells you how many to go left (if negative) and right (if positive).

* The 2nd number tells you how many to go up (if positive) and down (if negative).

* Then from that point, we will use the slope to get the 2nd point.

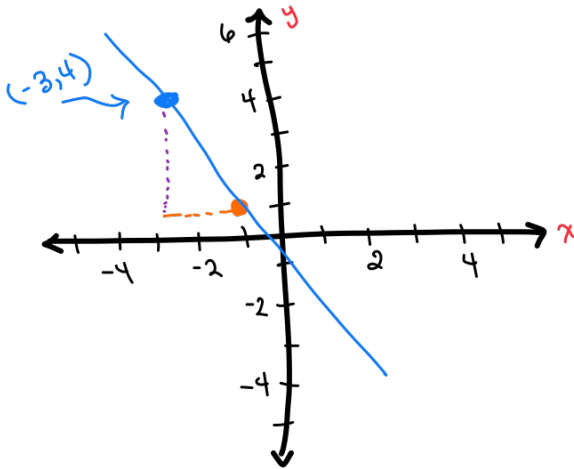
* Always think of the slope as a fraction. (if it is not a fraction, make it a fraction by putting a 1 under it.

* Then, the top number tells you how many to go up (if positive) and down (if negative). The bottom tells you how many to go right.

$$\text{slope} = 2 = \frac{2}{1} \quad \leftarrow \text{go up 2} \quad \leftarrow \text{go right 1}$$

8. Graph the line given a point and the slope.

$$\begin{matrix} (-3, 4) \\ x \cdot y \end{matrix} \quad m = -\frac{3}{2}$$



* First graph the point given.

* The 1st number tells you how many to go left (if negative) and right (if positive).

* The 2nd number tells you how many to go up (if positive) and down (if negative).

* Then from that point, we will use the slope to get the 2nd point.

* Always think of the slope as a fraction. (if it is not a fraction, make it a fraction by putting a 1 under it).

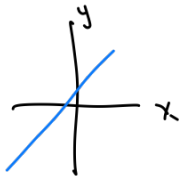
* Then, the top number tells you how many to go up (if positive) and down (if negative). The bottom tells you how many to go right.

$$\text{slope} = -\frac{3}{2} \quad \begin{matrix} \leftarrow \text{go down } 3 \\ \leftarrow \text{go right } 2 \end{matrix}$$

* Hint: If there is a negative with the slope, always put the negative with the top number.

* Remember:

positive slope



negative slope

