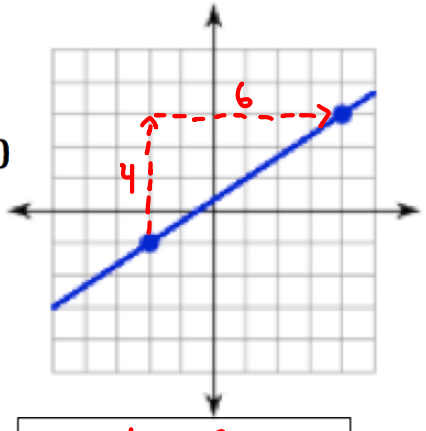
5.3b Slope

Part 1: Do It Now

Find the slope of each of the following lines by looking at the graph and determining the rise and the run.

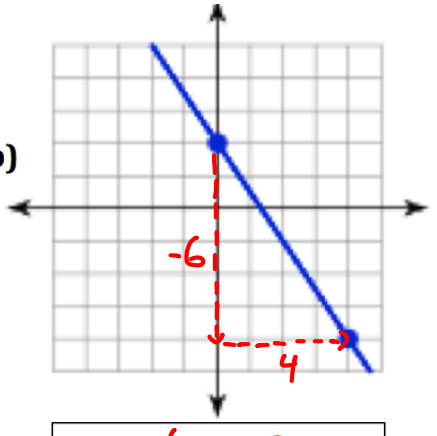
Remember: $slope = \frac{rise}{run}$

a)



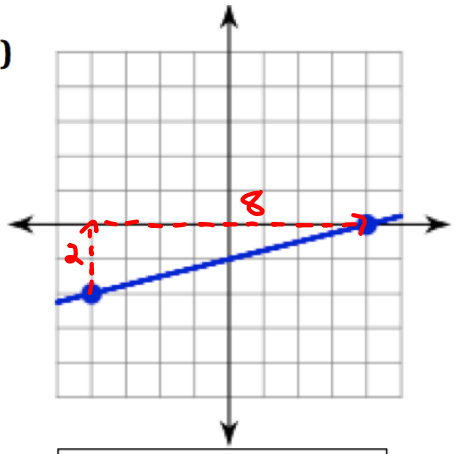
$m = \frac{4}{6} = \frac{2}{3}$

b)



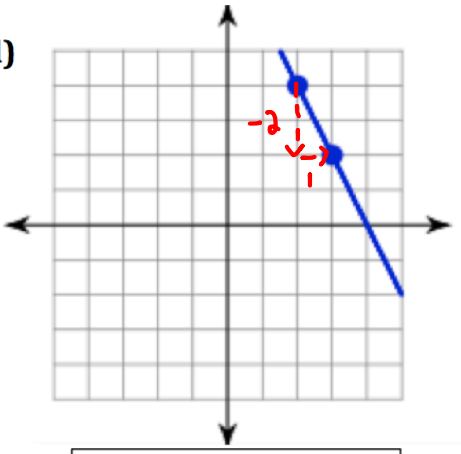
$m = \frac{-6}{4} = \frac{-3}{2}$

c)



$m = \frac{2}{8} = \frac{1}{4}$

d)



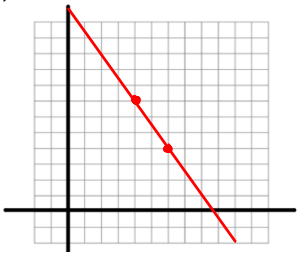
$m = \frac{-2}{1} = -2$

Part 2: Draw a graph to find another point on a line

Example 1: A line segment has one endpoint, A(4,7), and slope of $-\frac{3}{2}$. Find the coordinates of another possible endpoint, B.

Step 1: Plot the point A(4,7).

Step 2: Use the slope $-\frac{3}{2}$ (rise / run) to find another endpoint.



Note: $-\frac{3}{2} = \frac{-3}{2}$, therefore the line has a rise of __-3__ and run of __2__

To plot another point, start at point A and use the slope of the line to plot another point.

The rise of -3 tells us we should go __DOWN__ 3 units.

The run of 2 tells us we should go __RIGHT__ 2 units.

Another possible endpoint is: (6, 4)

Note: There are an infinite number of solutions!!! What would have happen if you used a slope of $\frac{3}{-2}$? Why does this happen?

Rise of 3, run of -2. Using this would give you another point on the same line but to the opposite side.

Example 2:

If a line has slope of $-\frac{1}{2}$, and the line passes through the point (4 , 5) determine the coordinates of two points to the left, and two points to the right on the same line.

Note: $-\frac{1}{2} = \frac{-1}{2} = \frac{1}{-2}$

Graphical solution:
('move' to other points according to the slope)

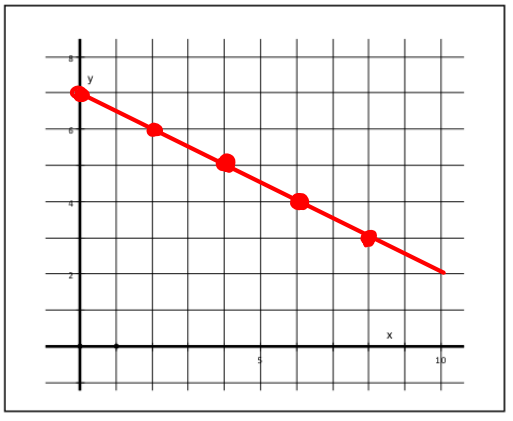


Table solution:
('move' to other points according to the slope)

x	*y*
0	7
2	6
4	*5*
6	4
8	3

Example 3:

If a line has slope of $m = \frac{1}{3}$, and the line passes through the point (-2 , -1) determine the coordinates of a point to the left and right on the same line.

Graphical solution:
('move' to other points according to the slope)

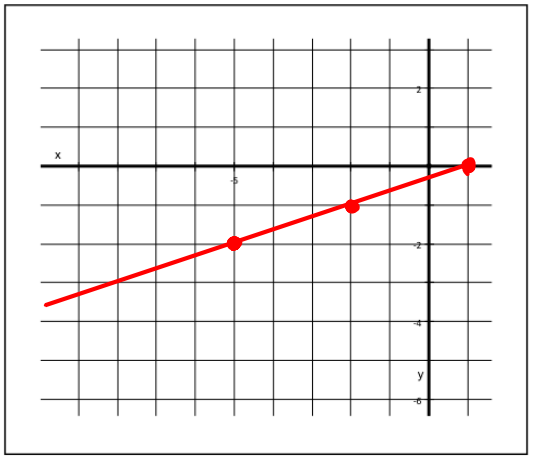


Table solution:
('move' to other points according to the slope)

x	*y*
-5	-2
-2	-1
1	0

Part 3: Use the coordinates to find another point on the line

Example 4: A line segment has one endpoint A(-2,7) and a slop of $-\frac{4}{3}$. Find the coordinates of another point on the line.

$-\frac{4}{3} = \frac{-4}{3}$ Therefore the line has a rise of -4 and a run of 3.

Add the rise to the y-coordinate and the run to the x-coordinate to find another possible point.

Other endpoint = (-2 + 3, 7 + (-4)) = (1, 3)

Note: you could also subtract the rise and run to find a point to the other side on the line.

Example 5: A line segment has one endpoint A(3,-5) and a slope of $-\frac{7}{2}$. Find the coordinates of another point on the line.

$-\frac{7}{2} = \frac{-7}{2}$ ← rise Δy / run Δx

Other point = (3+2, -5+(-7)) = (5, -12)