

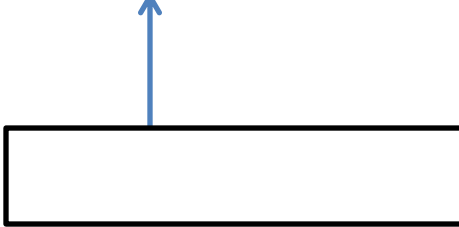
M9

$$y = mx + b$$

5.7

➤ $y = mx + b$ is a _____ equation of a line.

$$y = mx + b$$



Recall: y-intercept is the point where a graph intersects or touches the y-axis.

Note: A line will always intersect the y-axis unless the line is vertical.

- A vertical line will do one of two things: A = it will never intersect the y-axis or B = it will fully coincide with the y-axis.

Slope = is the pattern number when we use a sentence to describe a pattern: “when x increases by one, y increases/decreases by a number”.

Slope = the measure of steepness of a line.

Slope = a ratio of rise to run expressed as a fraction.

$$\text{slope} = m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

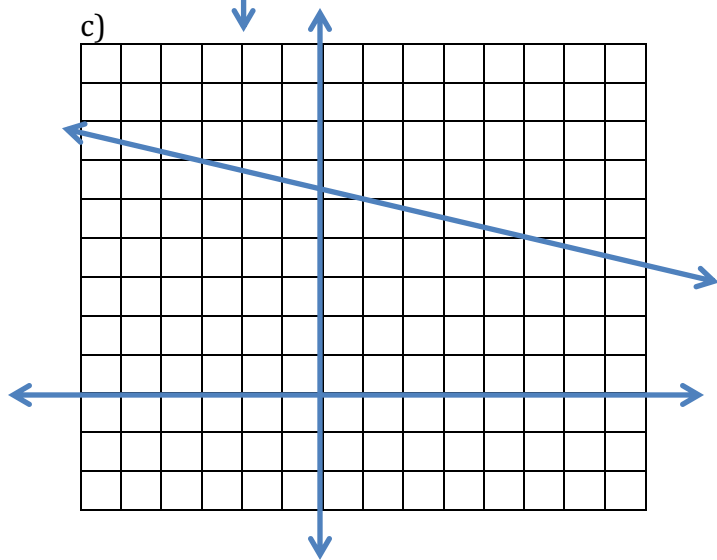
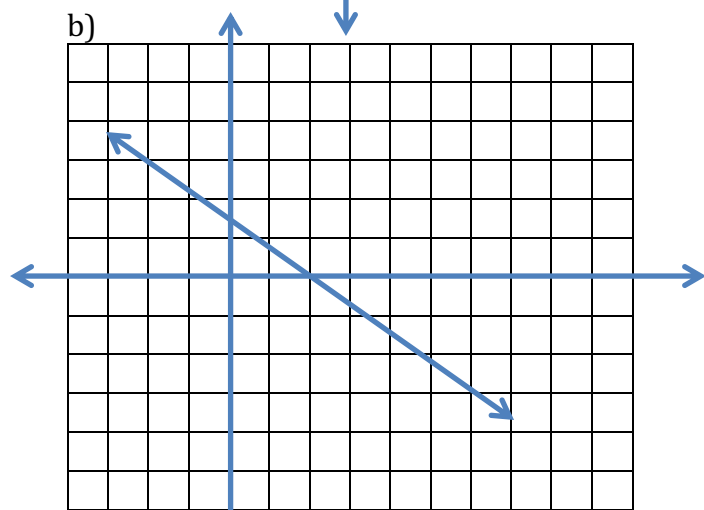
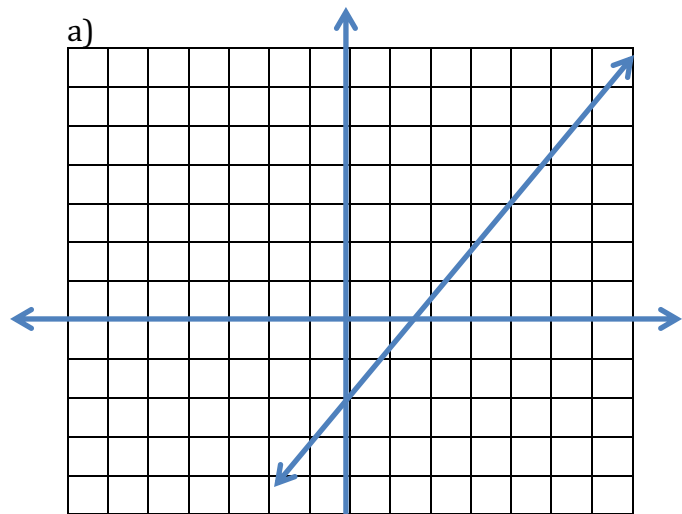
Where x_1 and y_1 are coordinates of point P_1 , x_2 and y_2 are coordinates of point P_2 and both points are on the line.

➤ The steeper the line = the larger is the number “m”.

➤ We can categorize the slope of a line in one of the four types:

Positive Slope	Negative Slope	Zero Slope	Undefined = Infinite Slope
The line is increasing.	The line is decreasing.	The line is horizontal = flat.	The line is vertical.
$m > 0$	$m < 0$	$m = 0$	m is undefined
$y = +\#x + b$	$y = -\#x + b$	$y = \pm\#$	$x = \pm\#$

You can determine a slope of a line from a graph by drawing in a useful right-angled triangle:



- You can calculate the slope of line given coordinates of two points that are on the line. Use the formula:



a) Determine the slope of a line that passes through A $(-2,5)$ and B $(6,7)$.

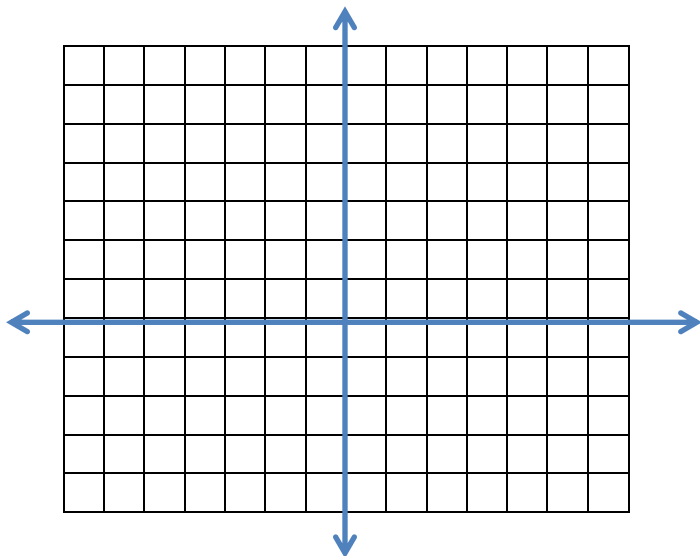
b) Determine the slope of a line that passes through A $(0,3)$ and B $(-9,4)$.

c) Determine the slope of a line that passes through A $(14,-6)$ and B $(12,-7)$.

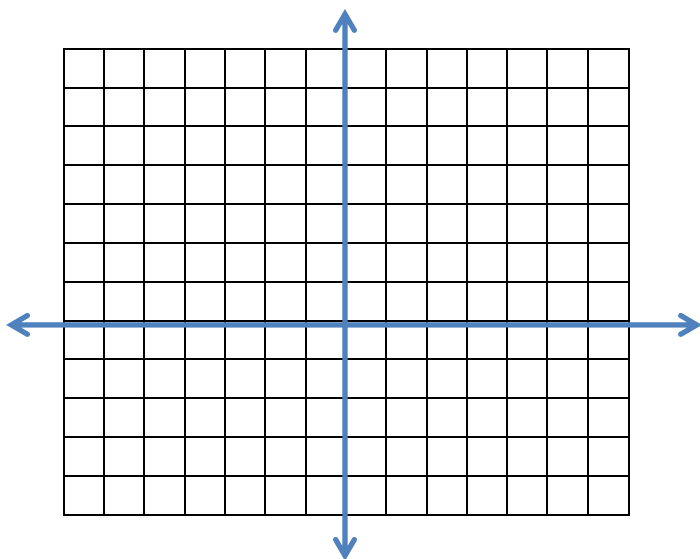
Practice graphing a line given an equation:

Note: If the equation given to you is not in $y=mx+b$ form, use algebra to change the equation so it is in the form $y=mx+b$.

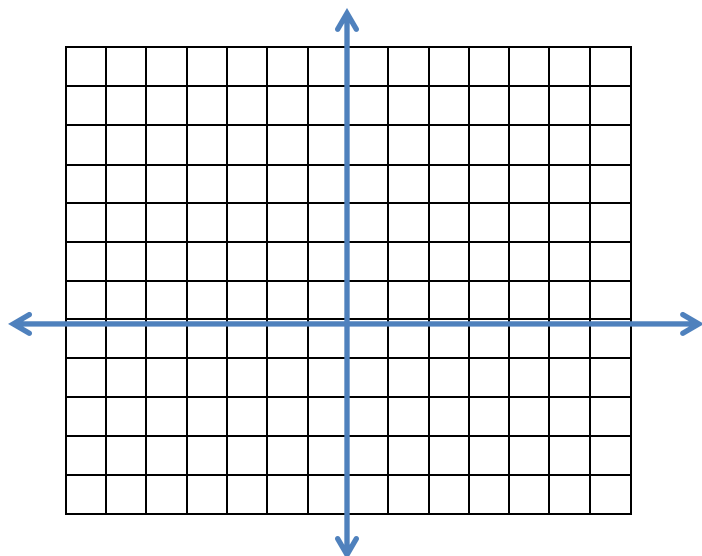
a) $y = \frac{1}{2}x - 3$



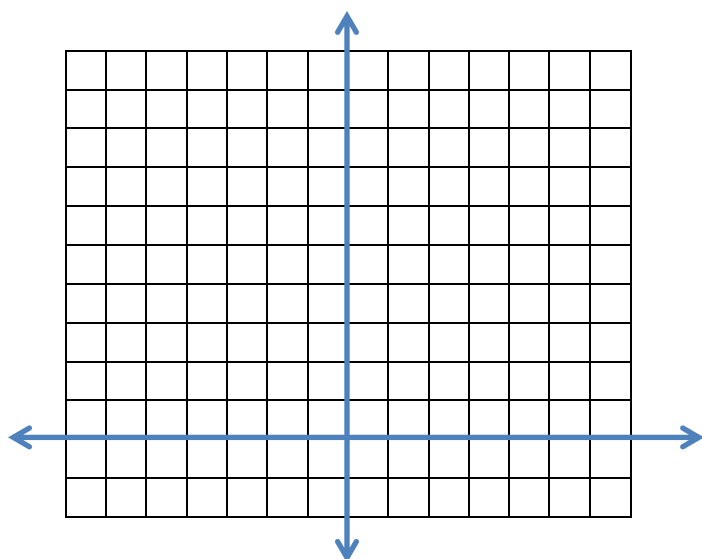
b) $y = -4x + 6$



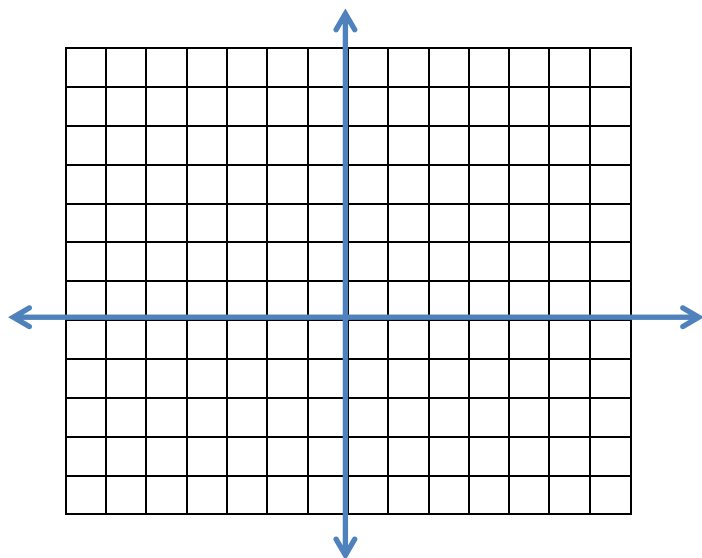
c) $y = 3x$



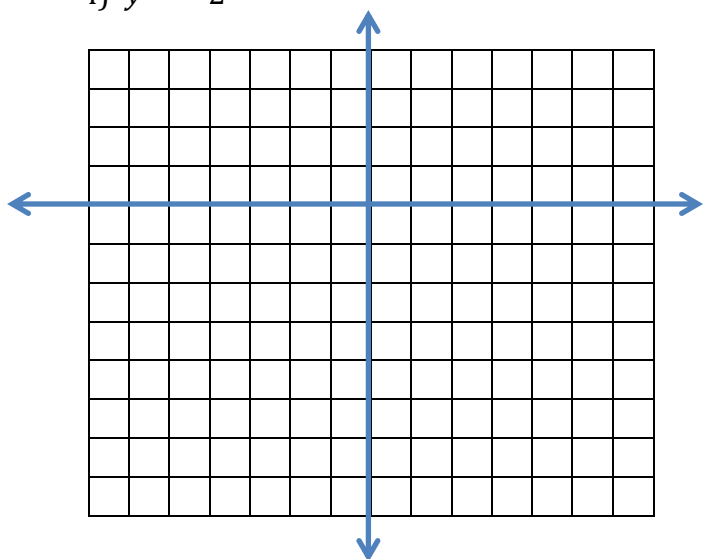
d) $y = -x + 35$



e) $4y - 12 = -6x$



f) $y = -2$



g) $x = -4$

