Math 9A Journal Entries

Learning Guide 10

Expectation 1: Graph lines using a table of values.

There are several methods of graphing straight lines and their equations. This first method is called *'graphing a linear equation using a table of values'*. When given an equation of a line, we can create a table of values and then graph the line by plotting those values on a grid.

Graphing an Equation – Using a Table of Values

Step #1: Draw a table with two columns and put 'x' and 'y' as the headings of the two columns.

Step #2: Choose some values for 'x'. Usually we choose easy numbers like 2, 1. 0. -1, -2. Write these values in your table.

Step #3: Substitute these 'x' values into the equation one at a time and calculate the corresponding 'y' values. Record these 'y' values in the table next to the appropriate 'x' value.

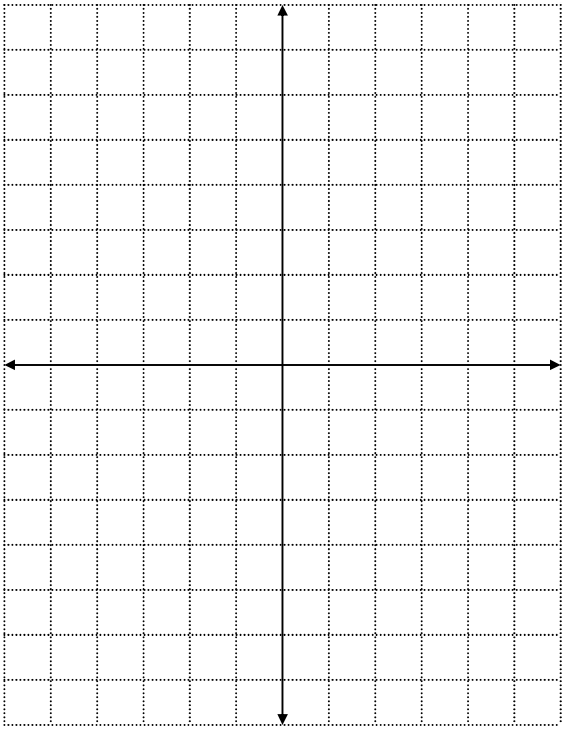
Step #4: Plot these points from your table onto a coordinate axis (graph). Remember that the 'x' value is the horizontal (left/right) distance and the 'y' value is the vertical (up/down) distance.

Step #5: Using a straight edge draw a straight line through these points, extending across the whole grid. Put arrows on both ends of your line.

Example #1: $y = 3x - 2$

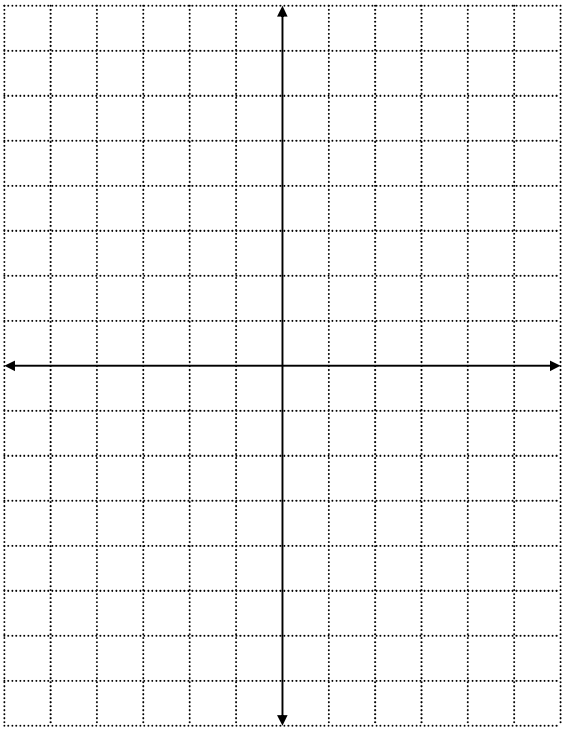
X	Y

*Need help with this example? Watch it being done on the video.



Example #2: y = -2x – 1

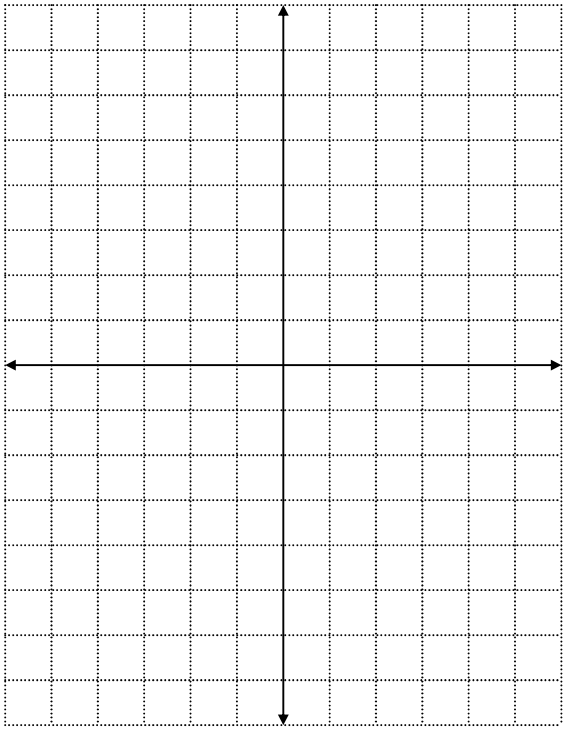
X	Y



*Need help with this example? Watch it being done on the video.

Example #3: y = -3x + 2

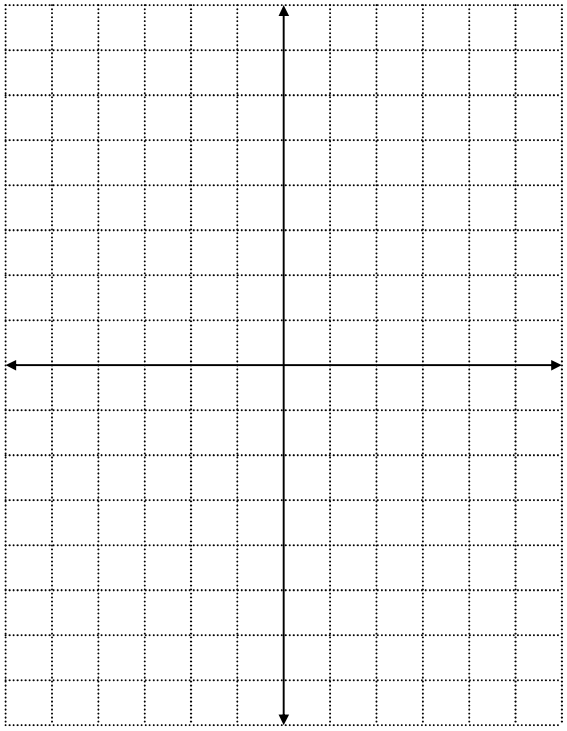
X	Y



Expectation 2: Read graphs, including interpolation and extrapolation.

Explain the difference between interpolation and extrapolation.

Draw a graph that would show how you could interpolate and extrapolate.

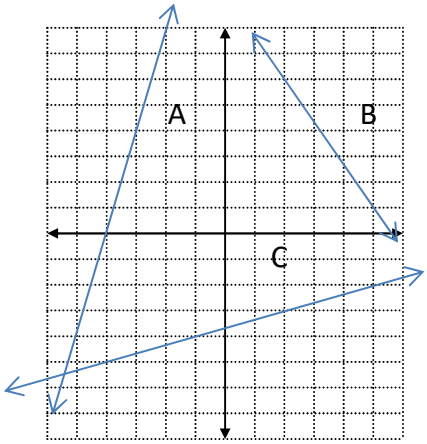


Expectation 3: Graph and analyze linear relations. Part (A) - Slope

The three lines drawn below are all going in different directions and some are steeper than others. Mathematically speaking, we say that the lines have different slopes. Slope (represented by the letter 'm') measures the steepness of a line and tells what direction it is pointing (based on whether it is positive or negative).

Slope is defined as the _____ over the _____ or $m = \frac{rise}{run} = \frac{change\_in\_y}{change\_in\_x}$

Find the slopes of the following 3 lines:



m = rise/run

Line A: m =

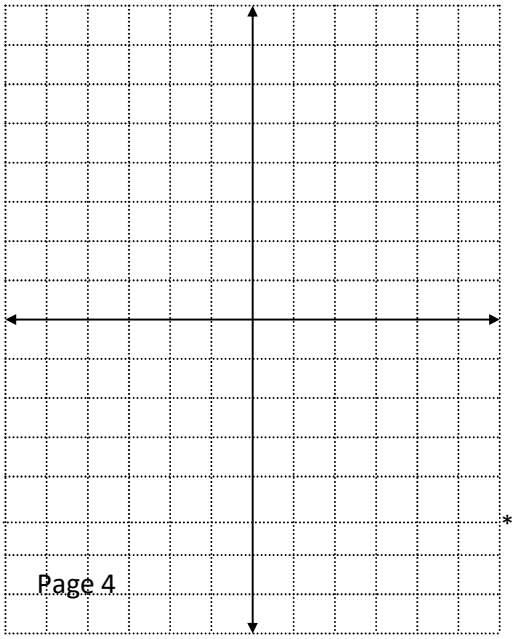
Line B: m =

Line C: m =

*Need help with these questions? Watch them being done on the video.

How can you graph a line when given a point on the line and the slope of the line?

1) Plot the given point on the graph.
2) Find a second point using the slope by starting from the first point and moving the rise distance in the 'y' direction and the run distance in the 'x' direction. This process can be repeated for finding a third or fourth point on the line.
3) Join the points you plotted using a straight edge. Put arrows on both ends of the line.



Example 1: Graph the line which contains the point (-5, -1) and has a slope of ½.

Example 2: Graph the line using the following information.

(1, -6), m = 3

Example 3: Graph the line using the following information.

(-2, 6), m = -3/5

*Need help with these examples? Watch them being done on the video.

Expectation 3 - Part (B) Equation of a line (y = mx + b)

a) The y-intercept of a line is the point where it crosses (touches) the _____.

b) When a linear equation is written in the form y = mx + b

'm' represents the _____ and 'b' represents the _____.

c) For the following two examples-

Step #1: Identify the slope and y-intercept from the equation

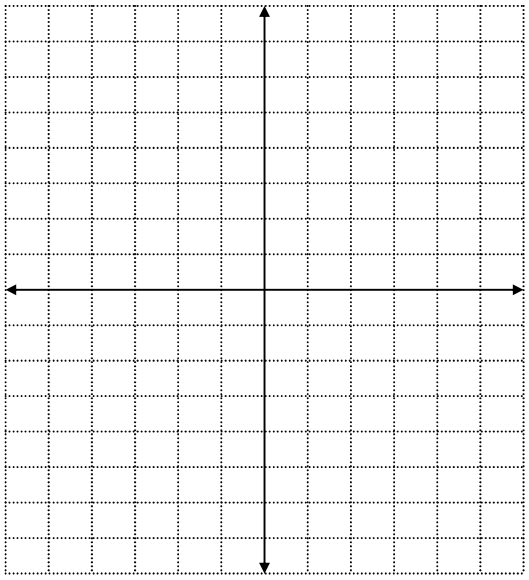
Step #2: Plot the y-intercept on the y-axis of the graph

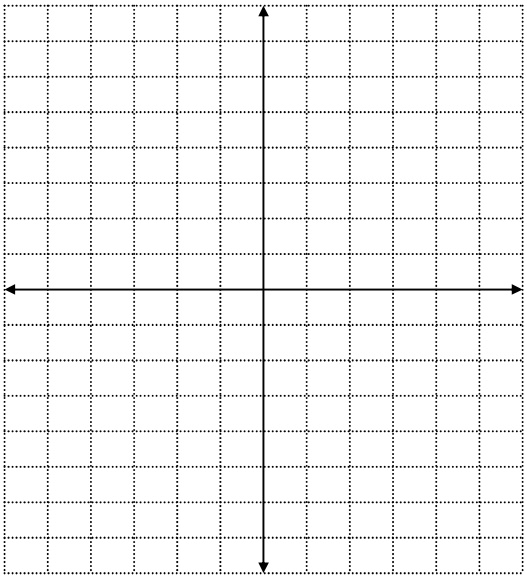
Step #3: Starting at the y-intercept on the graph, use the slope (rise and run) to plot the next point on the graph. Keep using the slope to plot more points on the graph.

Step#4: Using a straight edge, draw a straight line through these points and extend it across the whole grid. Put arrows on both ends of your line.

1) $y = \frac{2}{3}x - 4$ m = _____ b = _____

2) $y = -3x + 5$ m = _____ b = _____





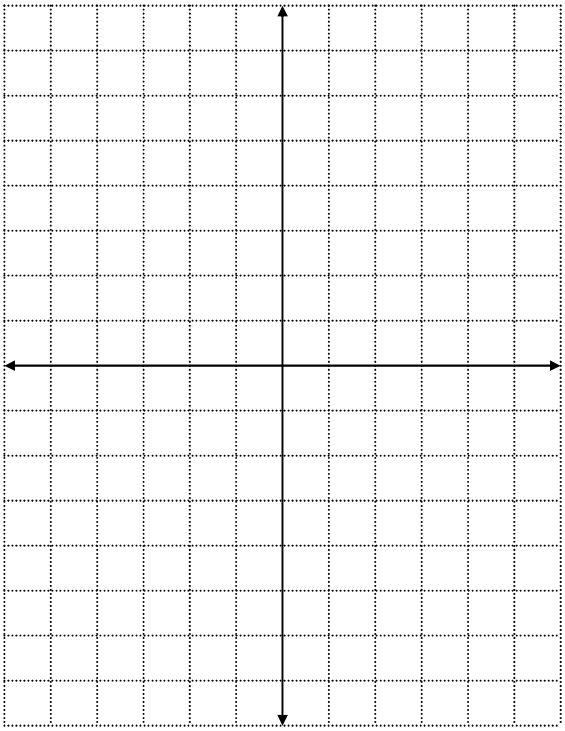
*Need help with these examples? Watch them being done on the video.

Expectation 4: Graph horizontal and vertical lines.

Complete the tables of values below and then plot the points to graph each line.

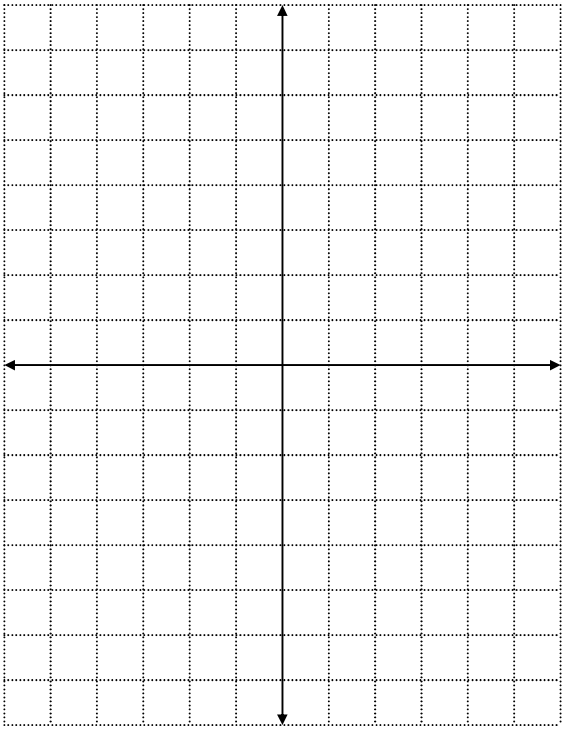
Example #1: y = 5

X	Y
-4	
-2	
0	
2	
4	



Example #2: y = – 3

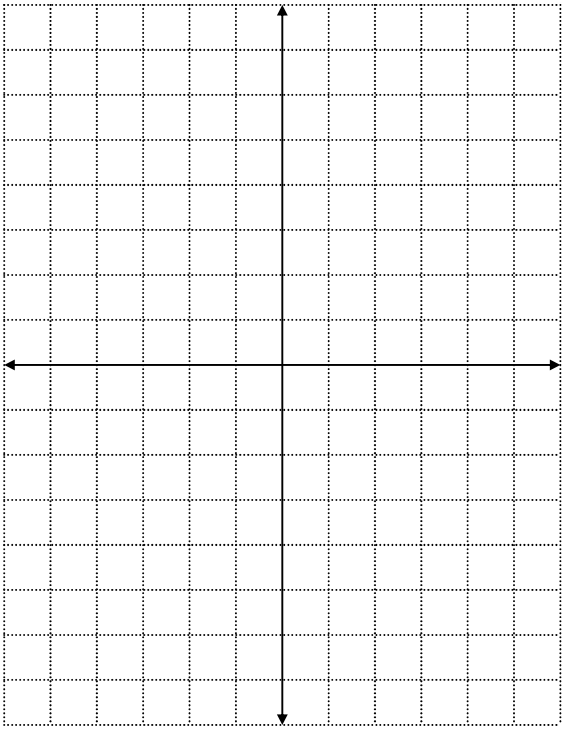
X	Y



***Note:** When graphing vertical lines you will need to choose values for 'y' instead of 'x'.

Example #3: x = 3

X	Y
	-4
	-2
	0
	2
	4



Example #4: x = -2

X	Y