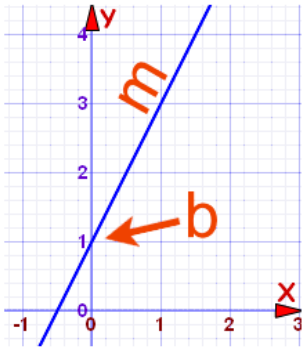
Name: _____ Date: _____

Day 4: Slope Intercept Equation & Graphing 7/8A

A **linear equation** is an equation for a straight line. There are many ways of writing a linear equation, but this year we will focus on the **slope-intercept method**:



$y = mx + b$

slope

y-intercept

m _____

b _____

If given a linear equation in slope intercept form, then one could find the slope (m) and y-intercept (b).

Example #1: State the slope and y-intercept of the following equations:

a: $y = \frac{2}{3}x - 4$ b: $y = \frac{-1}{6}x + 5$ c: $y = \frac{1}{3}x - 1$ d: $y = 2x$

m = _____ m = _____ m = _____ m = _____

b = _____ b = _____ b = _____ b = _____

Working Backwards (Gnikrow) ;)

If given the slope (m) and y-intercept (b), then one can write a linear equation in slope intercept form.

Example #2: Write a linear equation that satisfies the following requirements:

a: slope = $\frac{1}{2}$; y-intercept = −3 b: slope = 5; y-intercept = 11

c: m = $\frac{-2}{3}$; b =0 d: horizontal line that crosses y-axis at 5

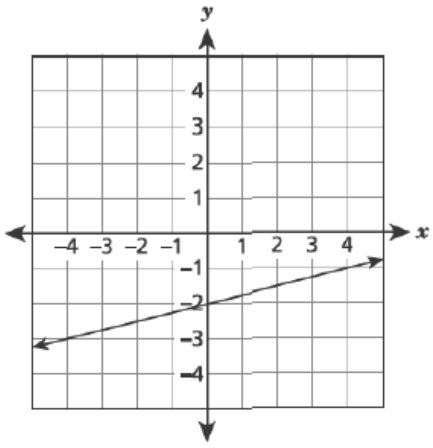
Example #3:

Which function of x has the **least** value for the y-intercept?

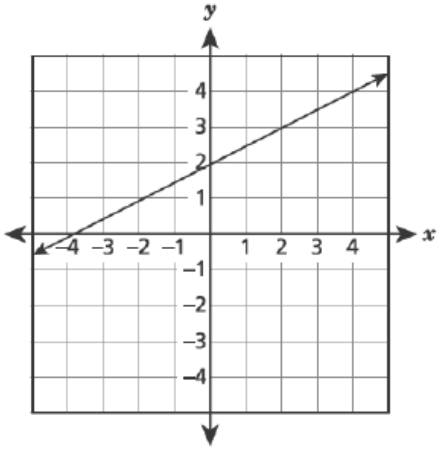
A $y = -4x + 15$

C $y = 2x - 3$

B



D



On your own!

(#1-3): Identify the slope and the y-intercept of the following linear functions.

1) **y = 2x + 9**

m = _____

b = _____

2) **y = –½x – 4**

m = _____

b = _____

3) **y = –5x**

m = _____

b = _____

4) **y = 8**

m = _____

b = _____

(#5-8): Write the equation of the line with the given information.

5) m = ¼ and b = –2

6) slope = 3 and y-intercept = (0, 7)

7) slope = $-\frac{2}{5}$ and y-intercept = (0, 0)

8) m = $\frac{3}{7}$ and b = 5

9) An equation of the line that has a slope of 4 and a y-intercept of –5 is:

1) x = 4y – 5 2) $y = -\frac{5}{4}x$ 3) y = 4x – 5 4) y = –5x + 4

10) What is the slope of the linear equation y = 4?

1) 4 2) undefined 3) zero 4) cannot determine

11) Which expression represents a line with a positive slope?

1) $\frac{3-2}{2-5}$ 2) $\frac{1-(-2)}{0-2}$

3) $\frac{-2-(-2)}{1-(-2)}$ 4) $\frac{6-2}{3-1}$

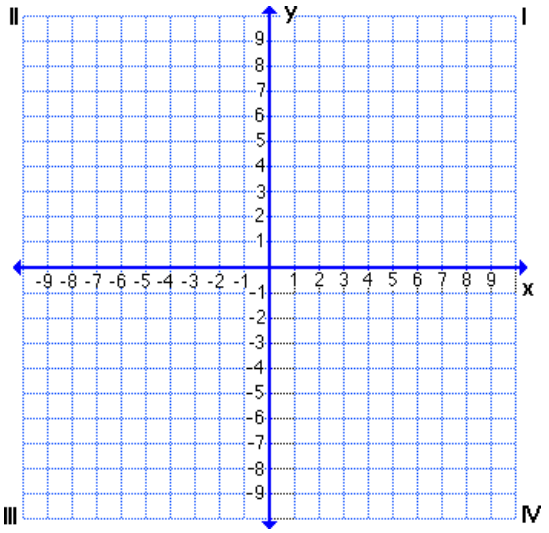
➢ *Instead of using the table, you can use the slope-intercept form of an equation to graph the function.*

Example #4: Graph: $y = 3x + 1$

m = _____ b = _____

Solution: _____

In which quadrant will the line never enter? _____

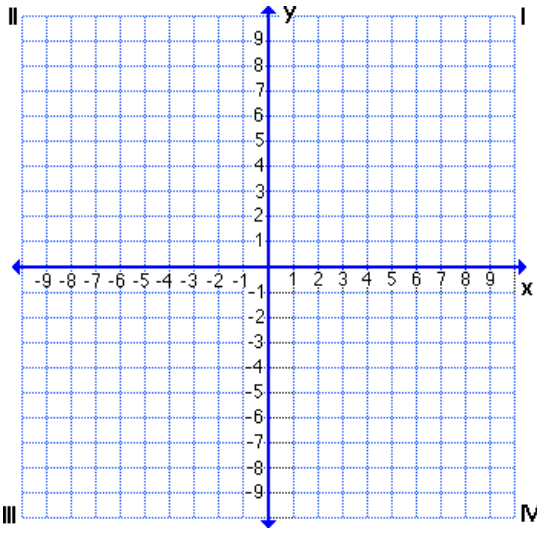


Example #5: Graph: $y = -\frac{1}{2}x - 2$

m = _____ b = _____

Solution: _____

In which quadrant will the line never enter? _____



Horizontal vs. Vertical Lines

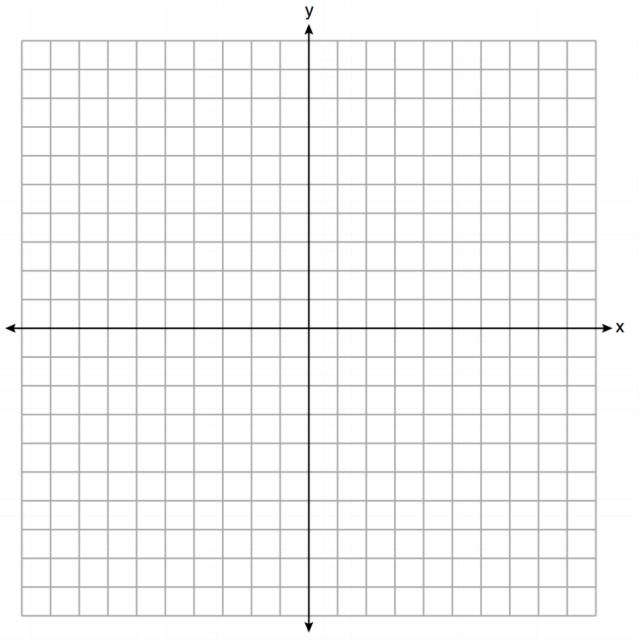
Example #6: Graph the points (-1,3) (0,3) (1,3) (2,3) and connect them.

a. What value stays constant? What is its value?

b. What type of line is this?

c. What is the slope of this line?

d. What is the equation of this line?



The equation of a _____ line is always in the form _____ = _____.

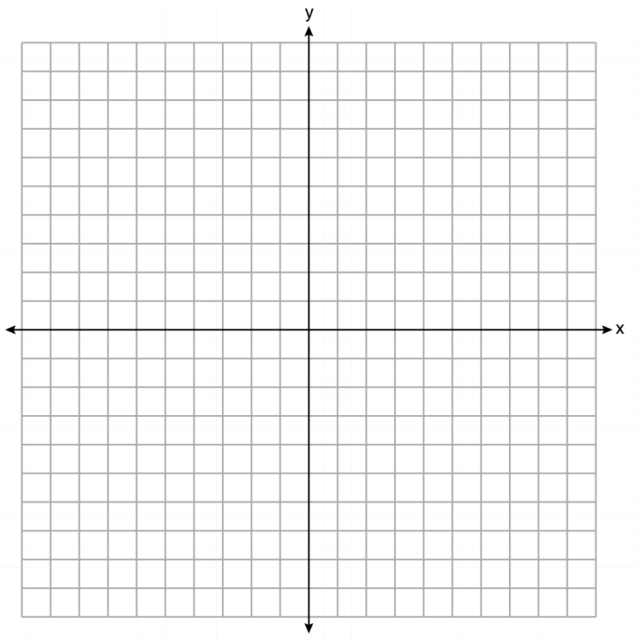
Example #7: Graph the points (2, -2) (2, -1) (2, 0) (2, 1) and connect them.

a. What value stays constant? What is its value?

b. What type of line is this?

c. What is the slope of this line?

d. What is the equation of this line?



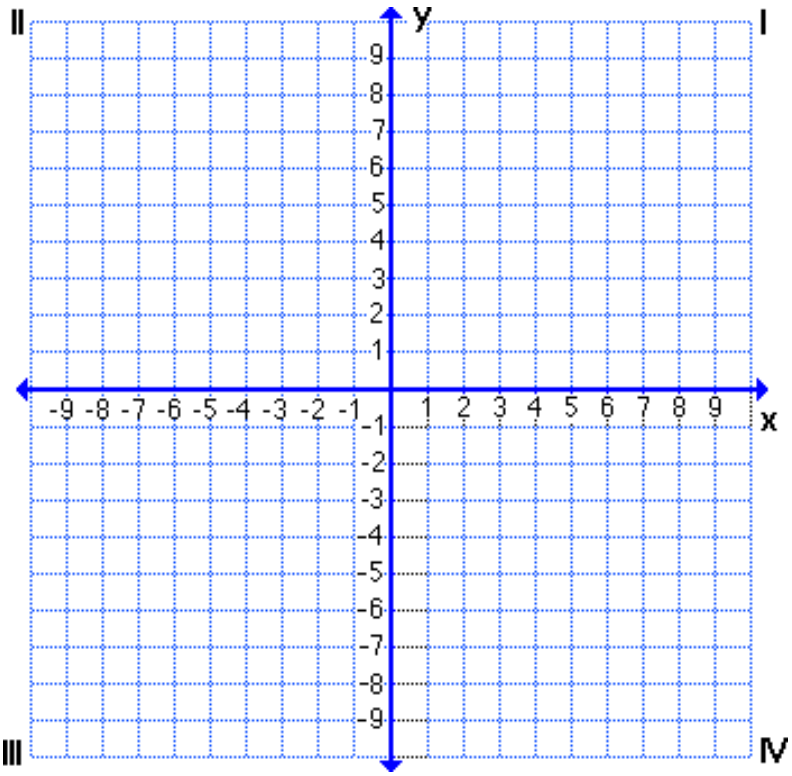
The equation of a _____ line is always in the form _____ = _____.

On your own: Graph the following equations on the graph below:

$y = -5x + 1$ $\qquad$ $y = \frac{1}{5}x + 3$ $\qquad$ $y = \frac{1}{5}x - 4$

m = _____ $\qquad$ m = _____ $\qquad$ m = _____

b = _____ $\qquad$ b = _____ $\qquad$ b = _____



Do you notice anything about the lines and their slopes?

➔ Parallel lines have the _____

➔ Perpendicular lines have _____