

Name: _____

Date: _____

Learning Goal 6.2	Constructing and using the following forms of a linear equation: <ul style="list-style-type: none"> • Slope – Intercept Form $y = mx + b$, • Slope – Point Form $y - y_1 = m(x - x_1)$, and • General Form $Ax + By + C = 0$.
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Let's consider the following 3 lines:

Equation	$y = \frac{3}{2}x - 15$	$y = -\frac{2}{3}x - 2$	$y = \frac{3}{2}x + 12$
Slope	$\frac{3}{2}$	$-\frac{2}{3}$	$\frac{3}{2}$
y-intercept	-15	-2	12
x-intercept	10	-3	-8

When $x=0$

When $y=0$

What do you notice? we can see the slope and the y-intercept represented in the equation

The Equation of a Line (in Slope-Intercept form):

$$y = mx + b$$

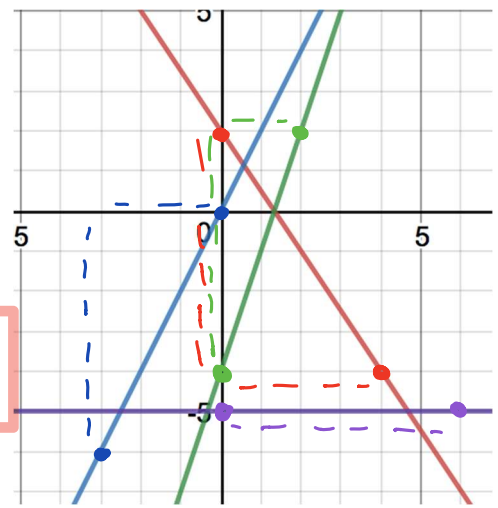
↑ slope ↑ y-intercept

Example Write the equation of each line in slope-intercept form.

Blue line: $m = \frac{+6}{+3} = 2$, y-int = 0 $y = 2x$

Green line: $m = \frac{+6}{+2} = 3$, y-int = -4 $y = 3x - 4$

Red line: $m = \frac{-6}{+4} = -\frac{3}{2}$, y-int = 2 $y = -\frac{3}{2}x + 2$



Purple: $m = \frac{0}{6} = 0$, y-int = -5 $y = 0x - 5$

$y = -5$

Example Graph each of the following lines without using a table of values.

a.

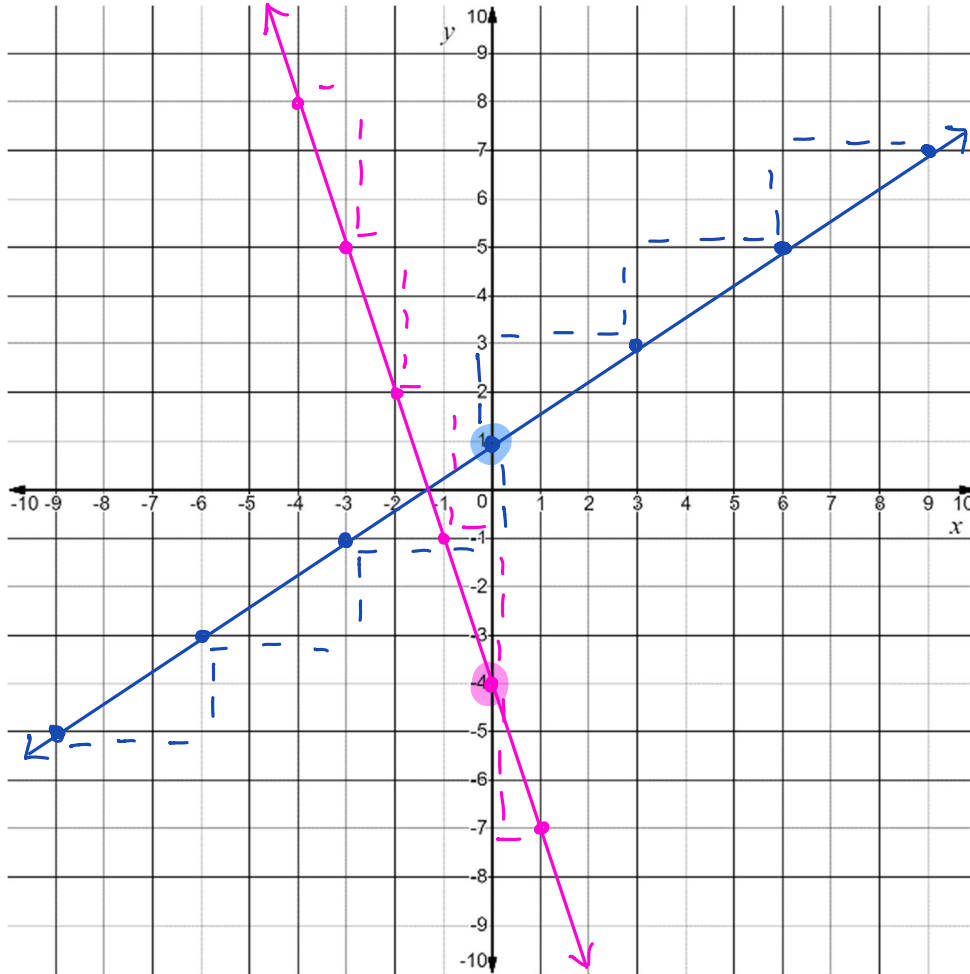
$y = \frac{2}{3}x + 1$ $\frac{+2}{+3} = \frac{-2}{-3}$

b.

$y = -3x - 4$

$\frac{-3}{+1} = \frac{+3}{-1}$

x	y
0	1
1	5/3
2	7/3
3	3
...	...



Example Which of the following points are on the line represented by the equation $y = 2x + 3$? How do you know? *use algebra (replace the x value, and see if the equation is the same as the y value)*

x y
(10, 23)

$y = 2x + 3$
 $= 2(10) + 3$
 $= 20 + 3$
 $= 23$ ✓

(1.5, 5)

$y = 2x + 3$
 $= 2(1.5) + 3$
 $= 3 + 3$
 $= 6$ ✗

(5, 12)

$y = 2x + 3$
 $= 2(5) + 3$
 $= 10 + 3$
 $= 13$ ✗

(200, 403)

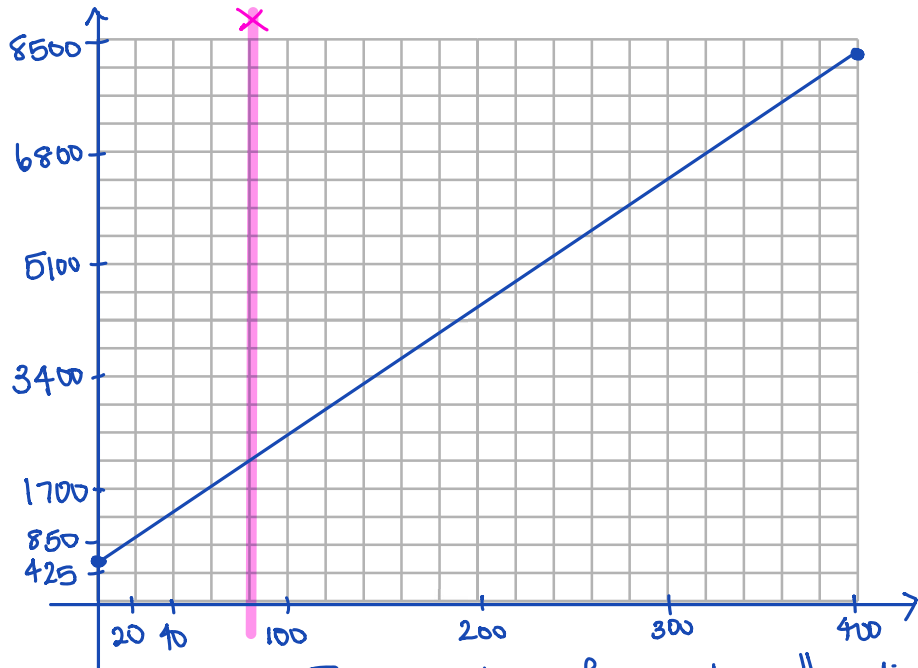
$y = 2x + 3$
 $= 2(200) + 3$
 $= 400 + 3$
 $= 403$ ✓

Example Student Council decides to hold a dinner-dance. The cost to decorate the gym, rent the dishes and sound equipment and to print the posters advertising the event is \$475. Dinner costs \$20 per person.

- a. Graph the cost of the event against the number of people who attend. The gym can hold a maximum of 400 people.

dependent variable

The cost of the event



independent variable

if no one attends, $C = 475$

if all the tickets are sold $C = 8475$

The number of people attending

- b. Write an equation to represent the cost of hosting the dance. Let C represent the total cost and p the number of students who attend.

y-int (no one attends) : $y = 475$

1 person 495
2 people 515

$$m = \frac{\Delta y}{\Delta x} = \frac{+20}{+1} = 20$$

$$C = 20p + 475$$

- c. What does the slope represent? What does the y-intercept represent??

↳ cost per person

↳ no one attending