4-3 Writing Equations

Objectives

I can create the equation of a line using a point and slope

I can graph a line in slope intercept form

I can identify parallel and perpendicular lines

Vocabulary

Slope: $\frac{\text{change in } y}{\text{change in } x}$, m (movement)

y-int: cross y-axis, b (begins)

Slope Intercept Form: $y = mx + b$ (m: slope, b: y-int; y-int)

Point Slope Form: $y = m(x - x_1) + y_1$ (x_1, y_1)

With a partner....

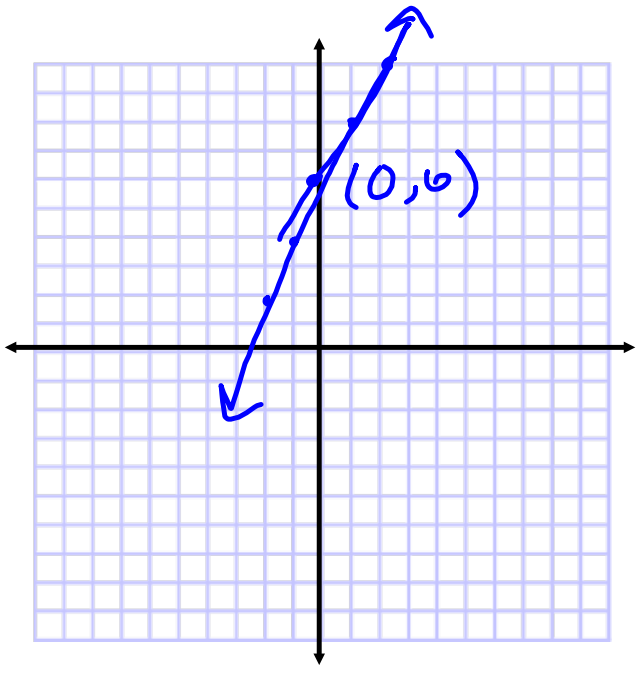
1. Graph a line with a slope of 2

2. Compare graphs with your neighbor

straight line, positive, steepness

3. What is the same? What is different about your graphs?

points, y-intercept



Still with your partner....

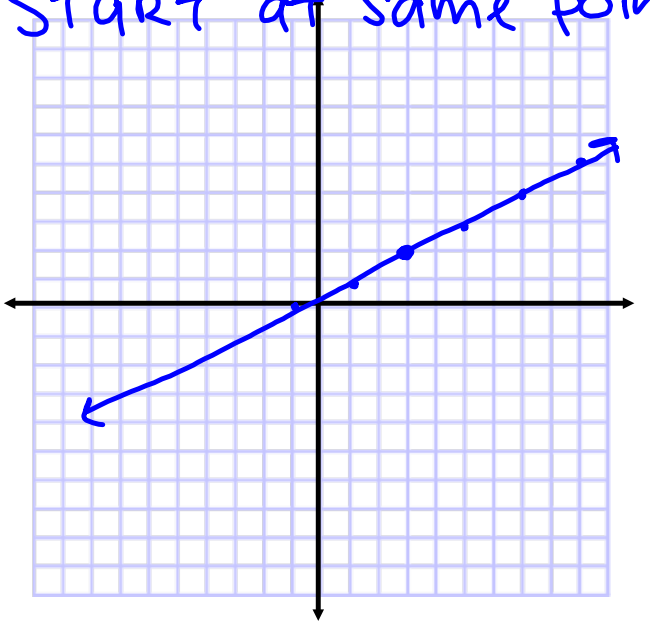
1. Plot the point (3,2)

2. Draw a line through the point (3,2) that has a slope of 1/2

3. Compare the line you drew with your neighbors'. Are they the same?

4. Looking back at the last problem, what could you change to make your lines the same?

START at same point



Point Slope Form

Given the point (x_1, y_1) and slope m

$$y - y_1 = m(x - x_1)$$

Slope Intercept Form

$$y = mx + b$$

m: slope

b: Y- Intercept

$$y - 5 = \frac{1}{2}(x - 2)$$

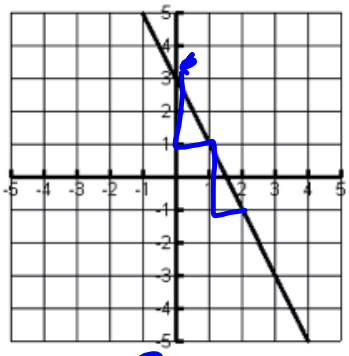
y_1 m x_1

$+5$ $+5$

$y = \frac{1}{2}(x-2) + 5$ point slope

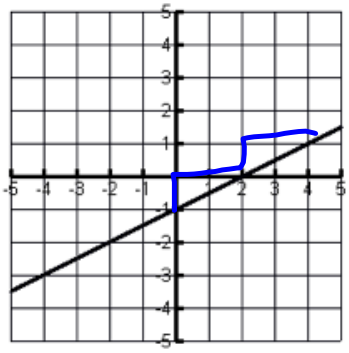
$y = 1/2x - 1 + 5$

$y = 1/2x + 4$ slope int.



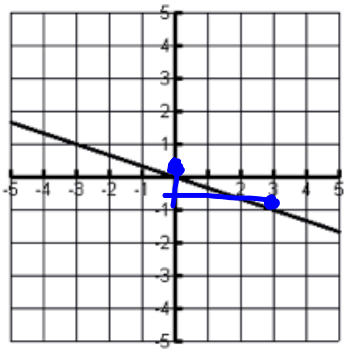
m = $\frac{-2}{1} = -2$

y-int = (0, 3)



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

y-int = (0, -1)



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

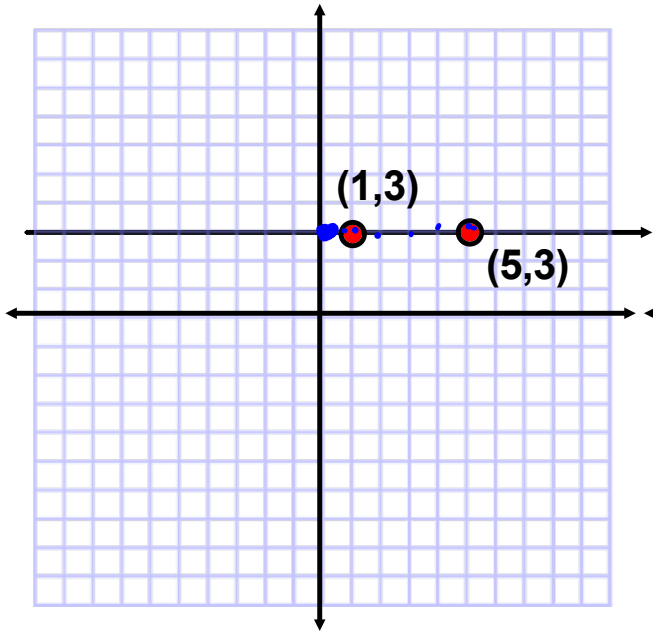
y-int = (0, 0)

equation: $y = mx + b$

$y = -2x + 3$

equation: $y = \frac{1}{2}x - 1$

equation: $y = -\frac{1}{3}x$

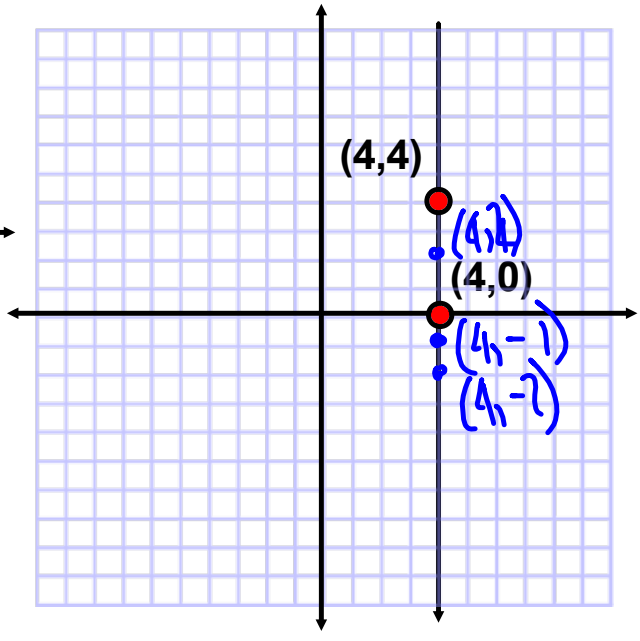


m = 0

y-int = (0,3)

equation: $y = 0x + 3$

$y = 3$



m = Undefined

y-int = DNE

equation: $x = 4$

$y = \text{und}(x) + \text{one}$

Writing Linear Equations Given the Slope and a Point

Write the equation of the line given the table

1.

x	y
-3	2
0	4
3	6
6	8

+3 +2 +3 +2 +3 +2

Find the slope: $\frac{2}{3}$

Y-int: (0, 4)

Equation: $y = \frac{2}{3}x + 4$

*Note: If you know the initial term you can use the explicit equation

Writing Linear Equations Given two points (one point y-intercept)

Write the equation of the line given the points

1. (-2, 5) , (2, 8)

x y

(-2, 5)

(2, 8)

+3

Find m: 3/4

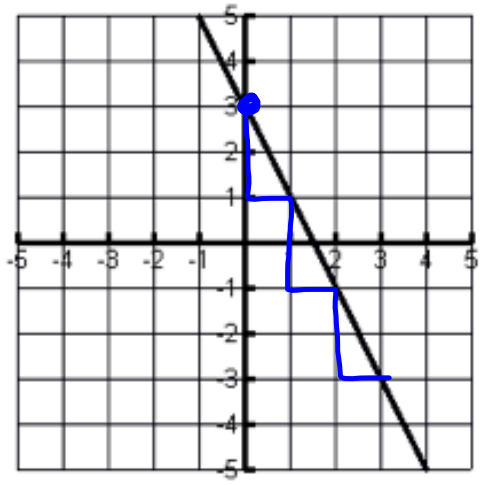
Point: (2, 8)

Write the equation

$y = \frac{3}{4}(x-2)+8$

$y = \frac{3}{4}(x+2)+5$

Looking at the graph. What is the slope and y - intercept?



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

Y - Intercept : $(0, 3)$

Equation: $y = -2x + 3$

$y = m(x - x_1) + y_1$

1.) $\overset{x_1, y_1}{(-3, 1)}$ $m = 3$

$y = 3(x - (-3)) + 1$

$y = 3(x + 3) + 1$

2.) $(6, 2)$, $m = \frac{1}{2}$

$y = \frac{1}{2}(x - 6) + 2$

3.) $\overset{x_1, y_1}{(y_2, 4)}$ $m = 9$

$y = 9(x - \frac{1}{2}) + 4$

November 02, 2016