

Writing Linear Equations Day 2 Notes

Name: \_\_\_\_\_

Objective: I can write linear equations given two points in slope-intercept form.

Slope Intercept Form:

$$y = mx + b$$

Write an equation of a line with the given slope m and point on the line.

Ex 1)  $m = -3$ ,  $(4, 2)$   
 $\begin{matrix} x & y \end{matrix}$

$$\begin{aligned} y &= mx + b \\ 2 &= -3(4) + b \\ 2 &= -12 + b \\ +12 & \quad +12 \end{aligned}$$

$$14 = b$$

$$y = -3x + 14$$

Write an equation in slope-intercept form of the line that passes through the two given points.

Steps:

- 1) find slope:  $m = \frac{y_2 - y_1}{x_2 - x_1}$
- 2) choose one point (pick one with a zero if possible)
- 3) plug in slope and point  $(x, y)$  into  $y = mx + b$
- 4) solve for b
- 5) Write equation with "m" and "b"  $y = mx + b$

1)  $(-1, 2), (0, 0)$

$\begin{matrix} x_1 & y_1 & x_2 & y_2 \end{matrix}$

$$m = \frac{0 - 2}{0 - (-1)} = \frac{-2}{1} = -2$$

pt  $(0, 0)$   
 $\begin{matrix} x & y \end{matrix}$

$$m = -2$$

$$\begin{aligned} y &= mx + b \\ 0 &= -2(0) + b \\ 0 &= 0 + b \end{aligned}$$

$$0 = b$$

$$y = -2x + 0$$

$$y = -2x$$

2)  $(-4, -1), (-8, 7)$

$\begin{matrix} x_1 & y_1 & x_2 & y_2 \end{matrix}$

$$m = \frac{7 - (-1)}{-8 - (-4)} = \frac{8}{-4} = \frac{2}{-1} = -2$$

pt  $(-4, -1)$   
 $\begin{matrix} x & y \end{matrix}$

$$m = -2$$

$$y = -2x - 9$$

$$\begin{aligned} y &= mx + b \\ -1 &= -2(-4) + b \\ -1 &= 8 + b \\ -8 & \quad -8 \end{aligned}$$

$$-9 = b$$

3)  $(2, 3), (2, -5)$   
 $x_1, y_1, x_2, y_2$

$$m = \frac{-5 - 3}{2 - 2} = \frac{-8}{0}$$

undefined  
vertical

$$x = 2$$



4)  $(-2, 5), (3, 5)$   
 $x_1, y_1, x_2, y_2$

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

$m = 0$  pt  $(3, 5)$   
 $x, y$

horizontal  $y = mx + b$

$$5 = 0(3) + b$$

$$5 = 0 + b$$

$$5 = b$$

$$y = 0x + 5$$

$$y = 5$$

What information do you need to write the equation of a linear function?

$$y = mx + b$$

1) slope, y-int  
 $m, b$

2) slope, point  
 $m, (x, y)$

3) y-int, point  
 $b, (x, y)$

4) 2 points  $(x_1, y_1), (x_2, y_2)$