

W-A2 Algebra 2 Week 9

10/30

x	y
0	2
2	4
3	6
4	

Yaw!

function

Each input yields  
one, and only one,  
output

Domain:  $\{0, 2, 3, 4\}$

Range:  $\{2, 4, 6\}$

x	y
0	-3
1	-6
4	-18
	-24

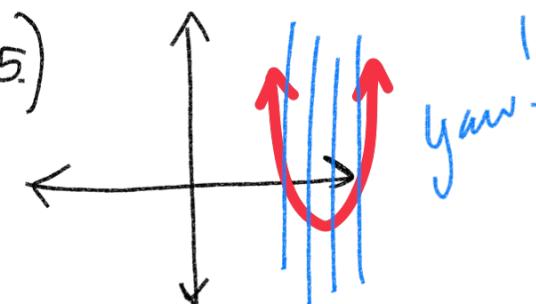
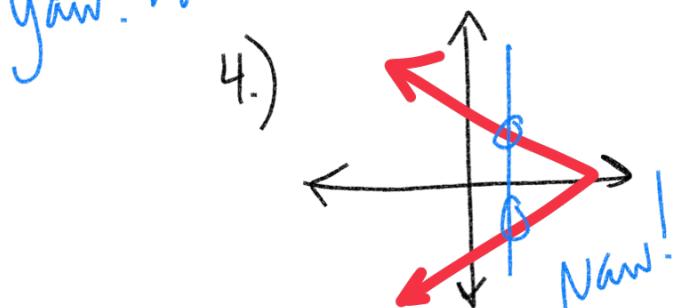
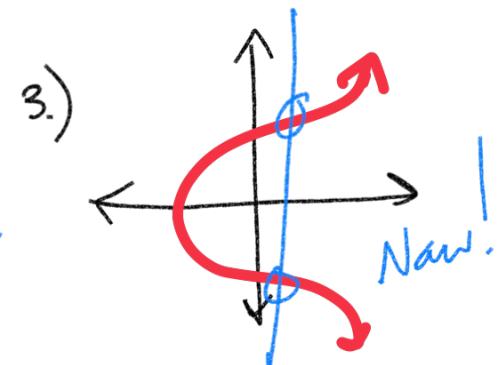
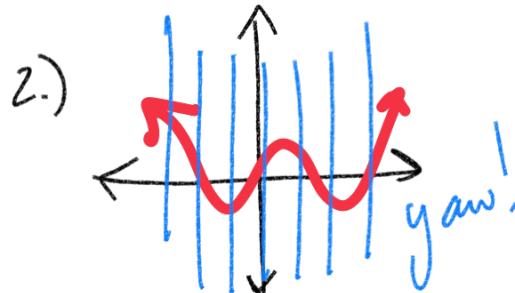
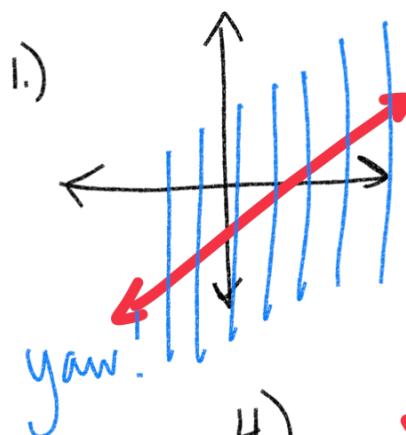
Not a function

3.)  $(1, 4), (2, 5), (3, 8), (2, 6)$   
Not function

4.)  $(-1, 3), (0, 8), (2, 18), (-3, -7)$   
Yaw! function

Domain:  $\{-1, 0, 2, -3\}$

Range:  $\{3, 8, 18, -7\}$



$$f(x) = 3x^2 + 6x + 12$$

input

input  $\rightarrow -1$   
output  $\rightarrow 9$

$$f(-1) = 3(-1)^2 + 6(-1) + 12$$

$(-1, 9)$

$$3(1) + 6(-1) + 12$$

$$3 + (-6) + 12$$

$$-3 + 12 = \boxed{9}$$

$$f(4) = 3(4)^2 + 6(4) + 12 \quad (4, 84)$$

$$3(16) + 6(4) + 12$$

$$48 + 24 + 12 = 84$$

$$f(x) = -2x + 4$$

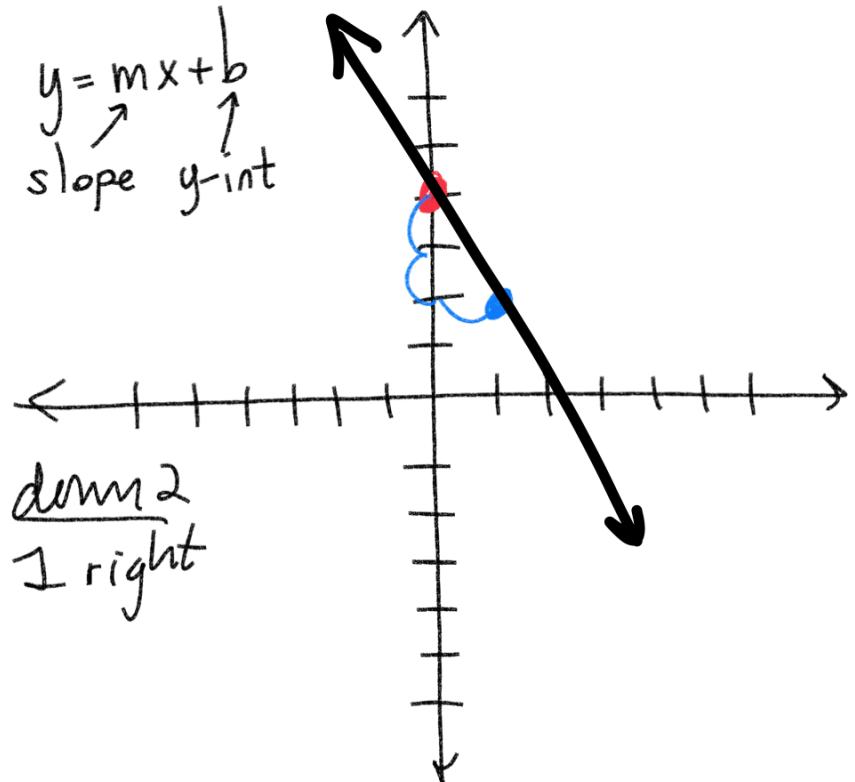
$$y = mx + b$$

slope      y-int

1.) Plot y-int

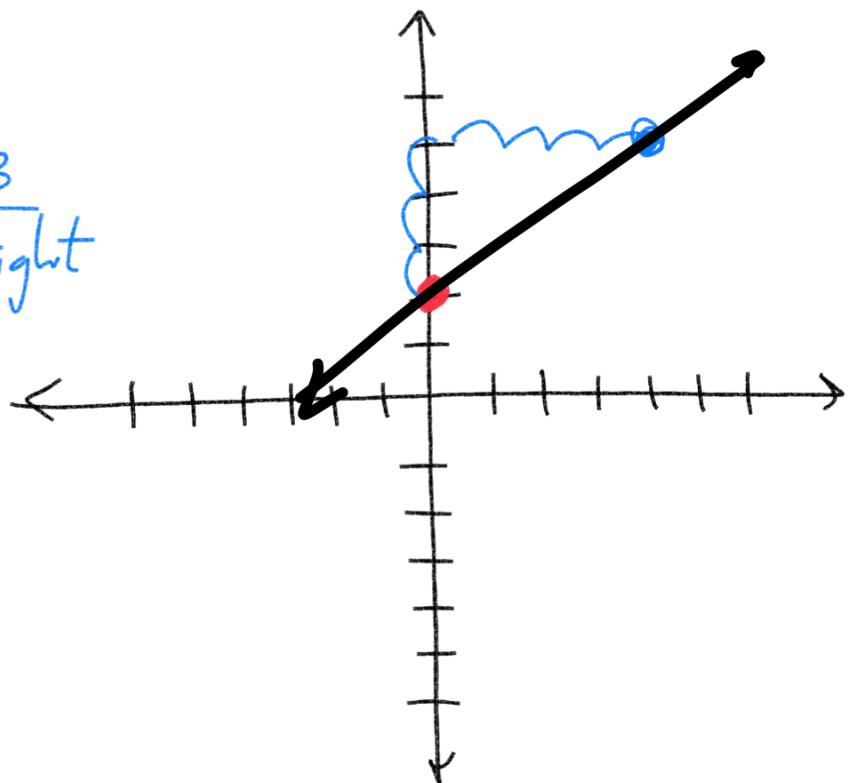
2.) Use slope

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{-2}{1} = \frac{\text{down 2}}{\text{1 right}}$$



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

slope =  $\frac{3}{4}$  = up 3 right



Standard Form

$$Ax + By = C$$

$$5x + 3y = -15$$

$$5x + 3y = -15$$

$\frac{3}{3}$

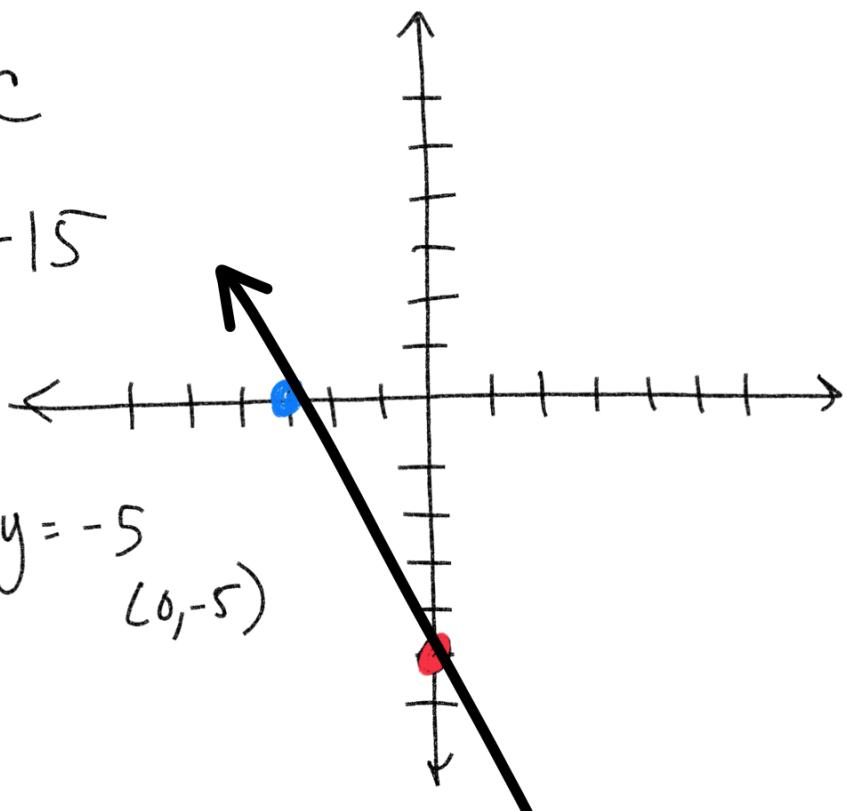
$y = -5$

$(0, -5)$

$$\frac{5x}{5} + \frac{3y}{5} = \frac{-15}{5}$$

$x = -3$

$(-3, 0)$

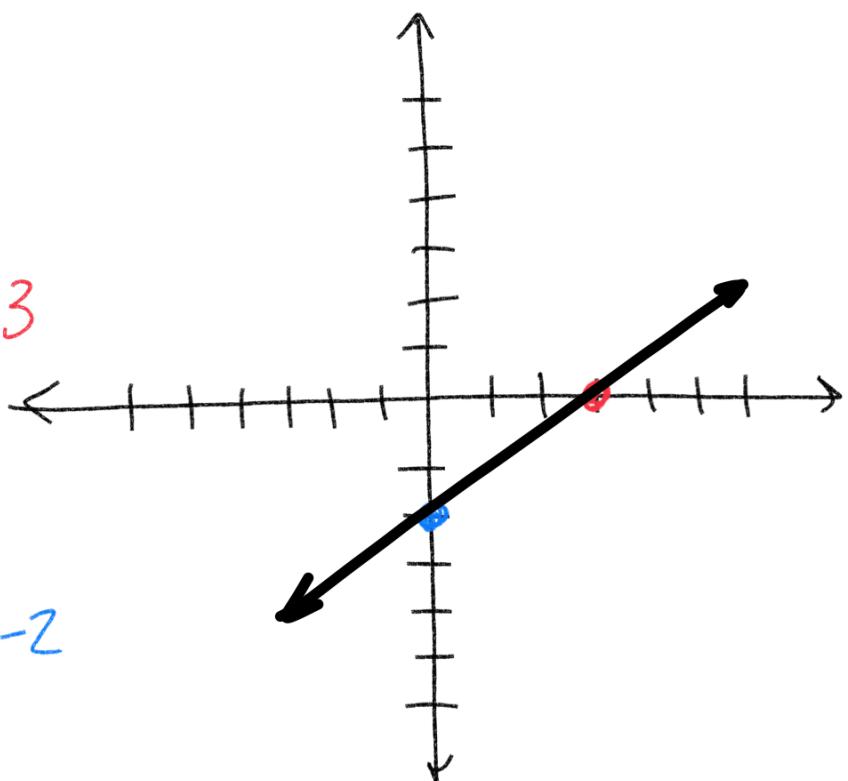


$$6x - 9y = 18$$

$$\frac{6x - 9y}{6} = \frac{18}{6} \quad x = 3$$

$\frac{6x - 9y}{-9} = \frac{18}{-9}$

$$y = -2$$



$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

(4, 3)  
x<sub>1</sub>, y<sub>1</sub>

(6, 9)  
x<sub>2</sub>, y<sub>2</sub>

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - 3}{6 - 4} = \frac{6}{2} = 3$$

(4, 3)      (6, 9)  
x<sub>2</sub>, y<sub>2</sub>      x<sub>1</sub>, y<sub>1</sub>

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 9}{4 - 6} = \frac{-6}{-2} = 3$$

Find the slope (1, 3) and (5, 11)

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 11}{1 - 5} = \frac{-8}{-4} = 2$$

Slope-intercept form

$$\underline{y = mx + b}$$

slope =

$$(x_2 - x_1) m = \frac{y_2 - y_1}{(x_2 - x_1)} (x_2 - x_1)$$

Find the equation  
for a line with slope  $\underline{\underline{m}} = 4$   
that goes through  $(\underline{\underline{3}}, \underline{\underline{2}})$

Optim #1:  $y = mx + b$

$$\begin{aligned} y &= mx + b \\ 2 &= (4)(3) + b \\ 2 &= 12 + b \\ -12 & \quad -12 \\ -10 &= b \end{aligned}$$
$$\boxed{y = 4x - 10}$$

$y - y_1 = m(x - x_1)$   
point-slope form

Optim #2

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 2 &= (4)(x - 3) \\ y - 2 &= 4x - 12 \\ +2 & \quad +2 \\ \boxed{y = 4x - 10} \end{aligned}$$

Find the equation for a line with slope  $m = -\frac{1}{2}$   
that contains  $(8, -2)$

$$y = mx + b$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$-2 = \left(-\frac{1}{2}\right)(8) + b$$

$$\begin{array}{rcl} -2 & = & -4 + b \\ +4 & & +4 \end{array}$$

$$2 = b$$

$$y = \underline{\underline{m}}x + \underline{\underline{b}}$$

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

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

Find the equation for a line through the points  $(2, 8)$  and  $(3, -2)$   $m =$

$$\text{Find slope: } \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - (-2)}{2 - 3} = \frac{8 + 2}{-1} = \boxed{-10} = m$$

$$y = mx + b$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$8 = (-10)(2) + b$$

$$\begin{array}{rcl} 8 & = & -20 + b \\ +20 & & +20 \\ \hline 28 & = & b \end{array}$$

$$y = mx + b$$

$$y = -10x + 28$$

