S-A2 Algebra 2 Session 7 7/1

1.) Determine whether each is a function:

a.)

x	y
0	2
2	4
3	6
4	

function

b.)

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

Not function

c.) (1,4), (2,5), (3,8), (2,-6)

Not function

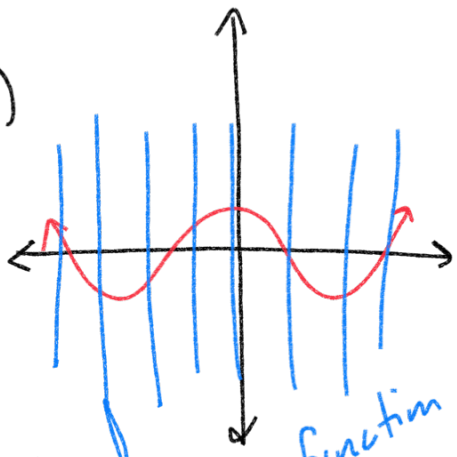
d.) (-1,3), (0,8), (2,18), (-3,-7)

function

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

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

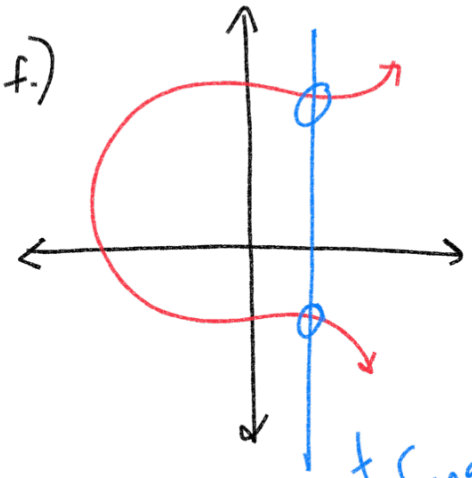
e)



Vertical test

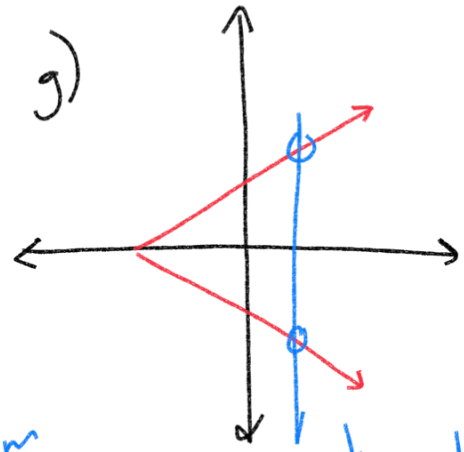
function

f.)



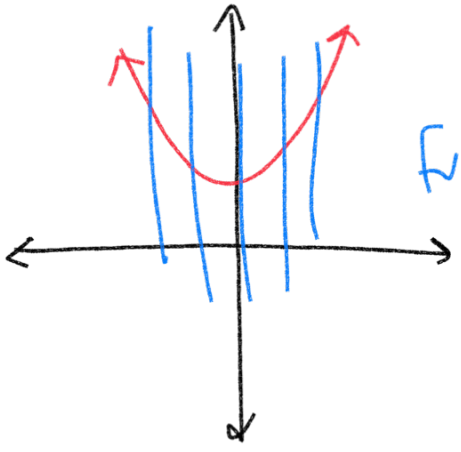
not function

g)



not function

h)



function

$y = -2x^2 - 5x$

$f(x) = -2x^2 - 5x$

input

$f(-6) = -2(-6)^2 - 5(-6)$

input → −6

$-2(36) - 5(-6)$

$-72 + 30 = -42$ ← output

$f(x)$ "f of x"

f variable

or "a function with respect to x"

x → input

f(x) → output

x y

(−6, −42)

(input, output)

$f(x) = 3x - 4$

$f(-2) = 3(-2) - 4$

$-6 - 4 = -10$

(−2, −10)

$f(0) = 3(0) - 4$

$0 - 4 = -4$

(0, −4)

$f(3) = 3(3) - 4$

$9 - 4 = 5$

(3, 5)

$y = mx + b$

slope-intercept form

m ← slope

b ← y-intercept

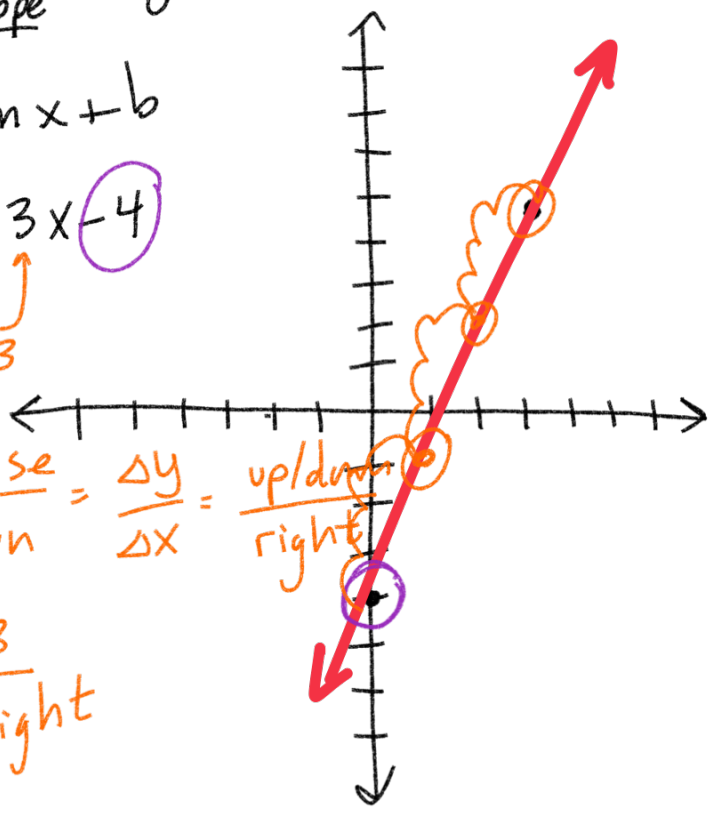
$y = mx + b$

$f(x) = 3x - 4$

slope of 3

$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{\text{up/down}}{\text{right}}$

$\frac{\text{up } 3}{1 \text{ right}}$



$f(x) = 2x + 3$ (y-int)

slope

$y = mx + b$

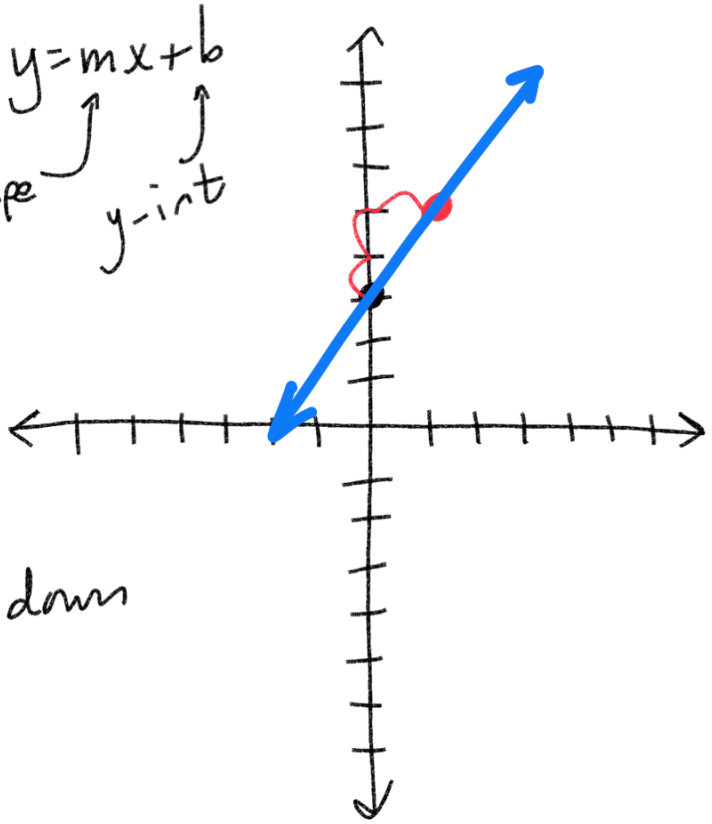
slope, y-int

1.) Plot y-int

2.) Use slope to find next point

⊕ up ⊖ down

$\text{slope} = 2 = \frac{2}{1} = \frac{2 \text{ up}}{1 \text{ right}}$

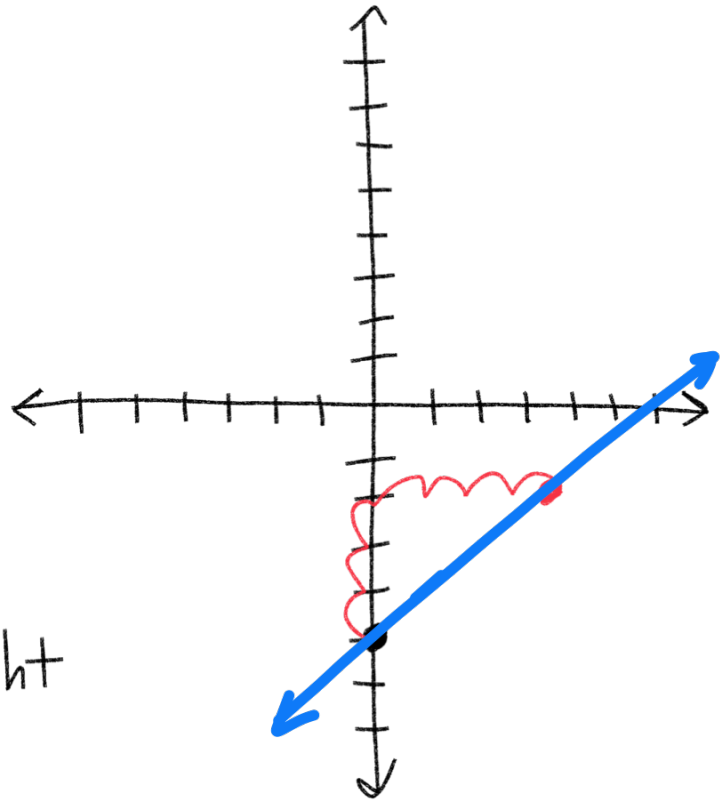


$f(x) = \frac{3}{4}x - 5$ (-5)

1.) Plot y-intercept

2.) Use slope

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



Standard Form

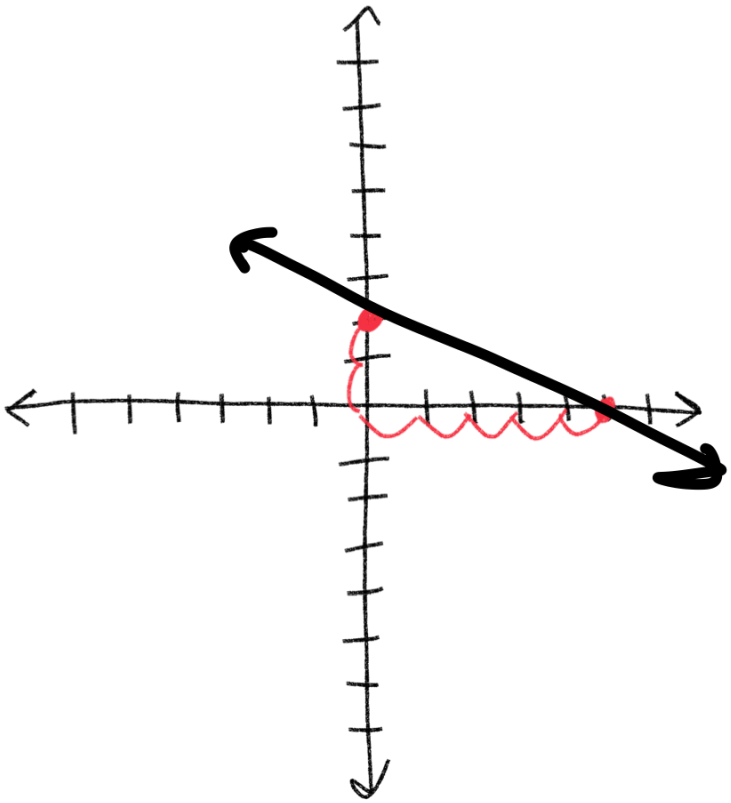
$Ax + By = C$

$2x + 5y = 10$

$\begin{cases} 2x + 5y = 10 \\ -2x \quad\quad -2x \end{cases}$

$\frac{5y}{5} = \frac{-2x}{5} + \frac{10}{5}$

$\{y = -\frac{2}{5}x + 2\}$



$\{2x + 5y = 10$

kill variables

$x = 0$ ~~$2x$~~ $+ 5y = 10$

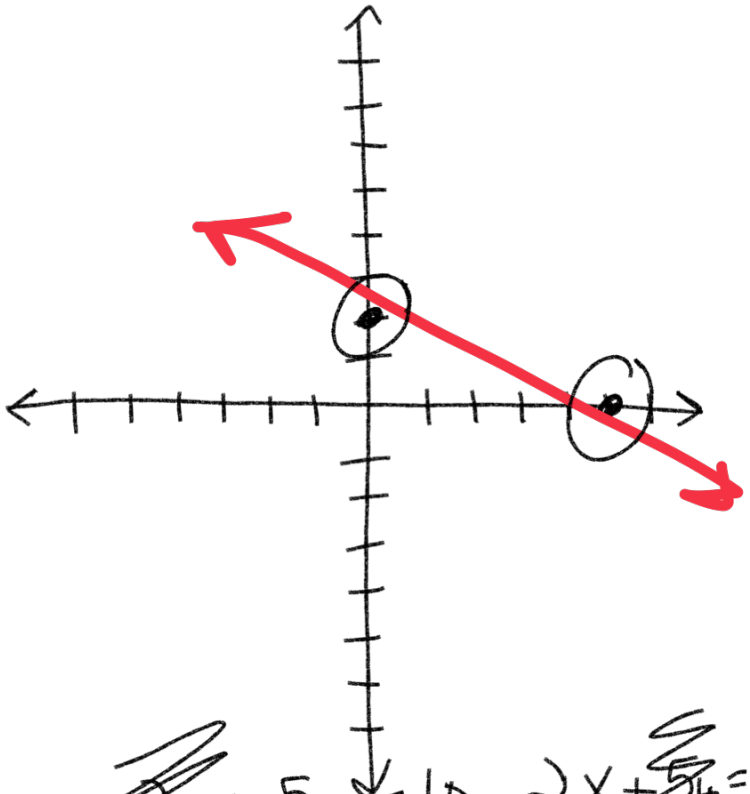
$\frac{5y}{5} = \frac{10}{5}$

$(0, 2)$

$y = 2$

$2x + 5y = 10$

$y = 0$ $(5, 0)$ $\frac{2x}{2} = \frac{10}{2}$ $x = 5$



~~$2x$~~ $+ 5y = 10$ $2x + 5y = 10$

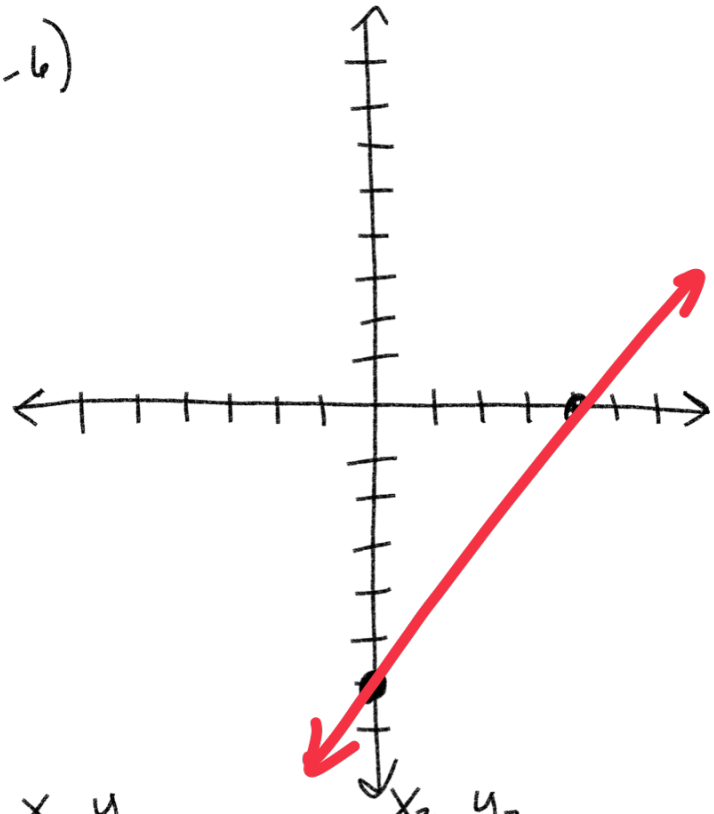
$-4y = 24$

$\frac{-4y}{-4} = \frac{24}{-4}$ $(0, -6)$

$y = -6$

$\frac{6x}{6} = \frac{24}{6}$

$x = 4$ $(4, 0)$



Find the slope $(1, 3)$ and $(5, 11)$ — x_1, y_1 — x_2, y_2

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

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{3 - 11}{1 - 5} = \frac{-8}{-4} = 2$$

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

$$y_2 - y_1 = m(x_2 - x_1)$$

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

Point-slope form

Find the equation for a line with a slope of $m = 4$ that contains $(x, y) = (3, 2)$.

Point-slope

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

$$y - 2 = 4(x - 3)$$

$$y - 2 = 4x - 12$$

$$+2 \qquad +2$$

$$\boxed{y = 4x - 10}$$

Slope-Intercept

$$y = mx + b$$

$$2 = (4)(3) + b$$

$$2 = 12 + b$$

$$-12 \quad -12$$

$$b = -10$$

$$y = mx + b$$

$$\boxed{y = 4x - 10}$$