M - A2 Algebra 2 Week 9 11/6

1.)

x	y
0	2
2	4
3	6
4	

function

Each input has one, and only one, output.

x's
Domain: {0, 2, 3, 4}
y's
Range: {2, 4, 6}

2.)

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

not function

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

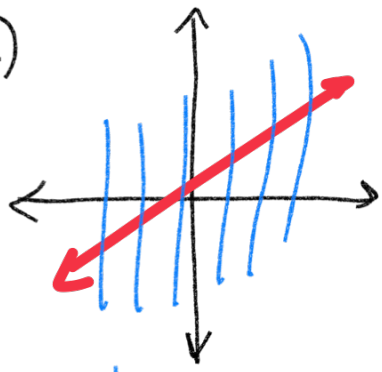
not function

4.) (-1,3), (0,8), (2,18), (-3,-7)

function

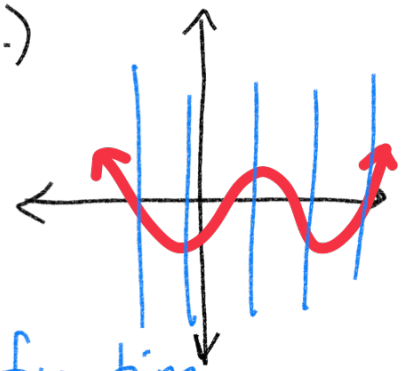
Domain: {-1, 0, 2, -3}
Range: {3, 8, 18, -7}

1.)



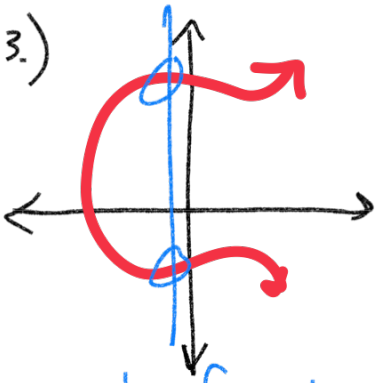
function

2.)



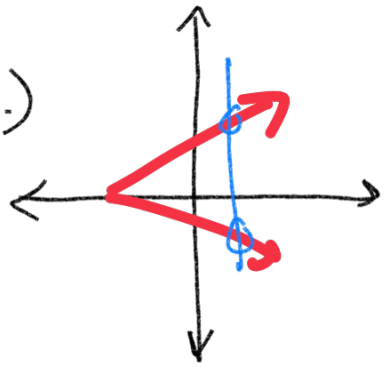
function

3.)



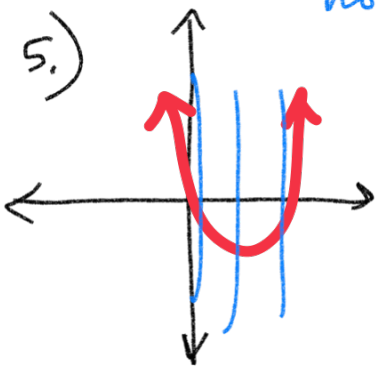
not function

4.)



not function

5.)



function

$f(\boxed{x}) = 3\boxed{x}^2 + 6\boxed{x} + 12$

$f(\boxed{-1}) = 3(\boxed{-1})^2 + 6(\boxed{-1}) + 12$

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

$3 - 6 + 12$

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

input → -1

output → 9

(-1, 9)

$f(\boxed{4}) = 3(4)^2 + 6(4) + 12$

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

$48 + 24 + 12$

$72 + 12 = 84$

input → 4

output → 84

(4, 84)

slope-intercept form

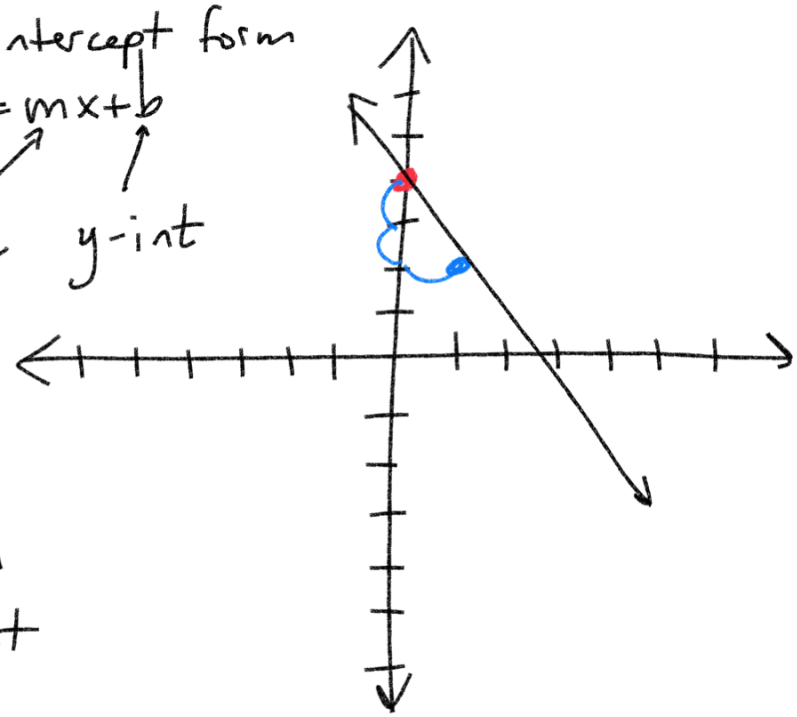
$f(x) = -2x \boxed{+4}$ $\quad y = mx + b$

slope y-int

1) Plot y-int

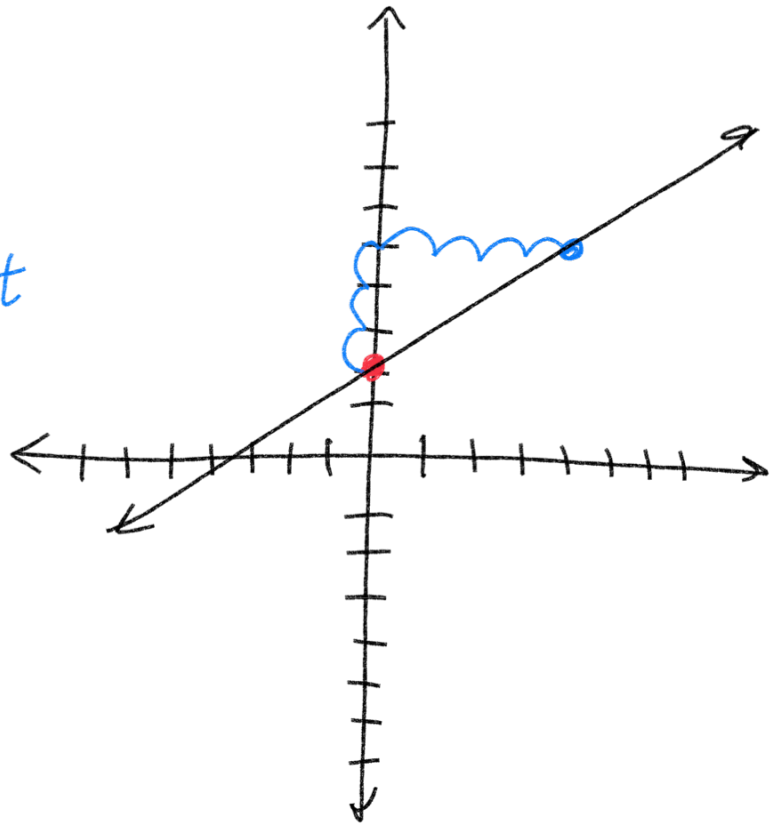
2) Use slope

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



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

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



standard Form

$Ax + By = C$

$4x + 3y = 12$

$\cancel{4x} + \frac{3y}{3} = \frac{12}{3}$

$x = 0$

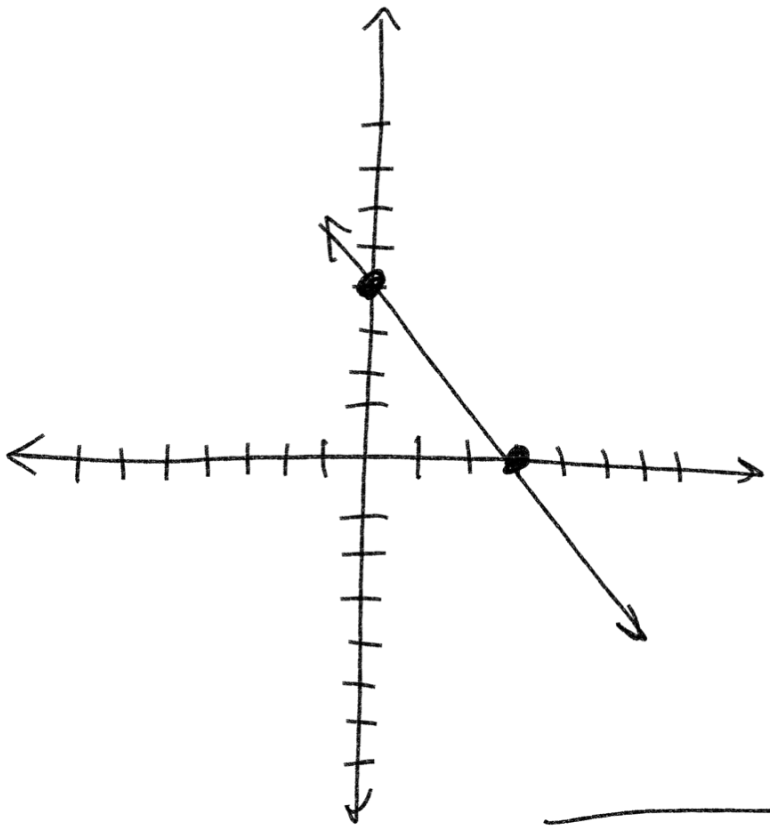
$y = 4$ $(0, 4)$

$4x + \cancel{3y} = 12$

$y = 0$

$\frac{4x}{4} = \frac{12}{4}$ $(3, 0)$

$x = 3$



$4x + 3y = 12$

$-4x \qquad -4x$

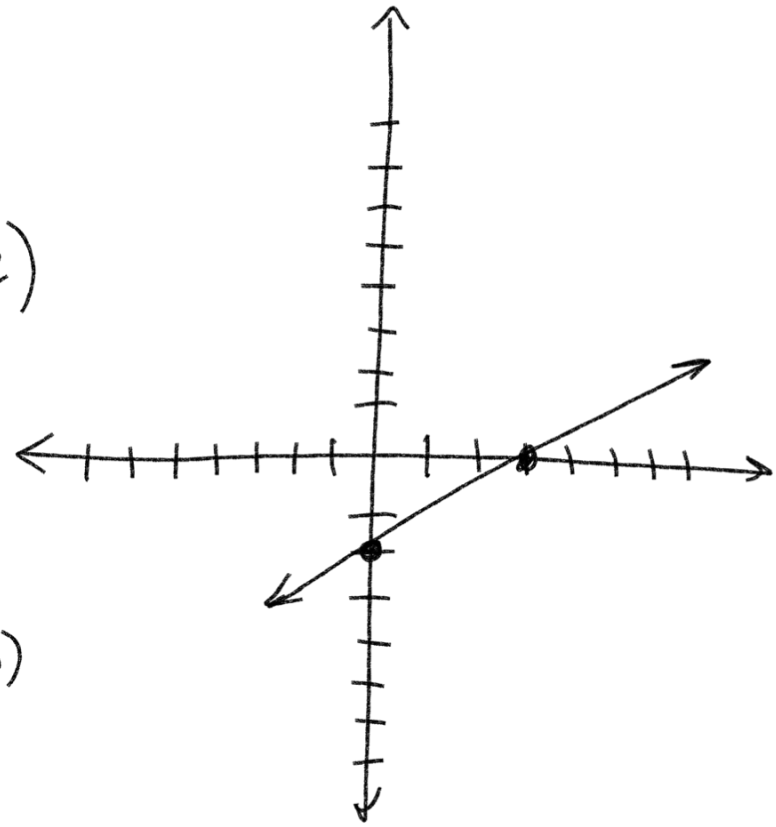
$\frac{3y}{3} = \frac{-4x}{3} + \frac{12}{3}$

$\boxed{y = \frac{-4}{3}x + 4}$

$$6x - 9y = 18$$

$$\cancel{6x} - \frac{9y}{-9} = \frac{18}{-9} \qquad (0,-2)$$

$$y = -2$$



$$\frac{6x}{6} - \cancel{9y} = \frac{18}{6} \qquad (3,0)$$

$$x = 3$$

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

$(4,3)$ $(6,9)$

$x_1\ y_1$ $x_2\ y_2$

$$\text{slope} = \frac{9-3}{6-4} = \frac{6}{2} = \boxed{3}$$

$(4,3)$ $(6,9)$

$x_2\ y_2$ $x_1\ y_1$

$$\text{slope} = \frac{3-9}{4-6} = \frac{-6}{-2} = \boxed{3}$$

Find slope. $(1,3)$ $(5,11)$

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

$m = \text{slope} = \dfrac{y_2 - y_1}{x_2 - x_1}$ $\quad (x_2 - x_1)m = \left(\dfrac{y_2 - y_1}{x_2 - x_1}\right)(x_2 - x_1)$

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

$y = mx + b$ $\qquad$ $y - y_1 = m(x - x_1)$

slope-intercept form $\qquad$ point-slope form

Find the equation for a line with $\boxed{m = 4}$ that contains $\boxed{(3, 2)}$

Option #1 point-slope

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

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

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

$$+2 \qquad\qquad +2$$

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

Option #2 slope-int

$$y = mx + b$$

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

$$2 = 12 + b$$

$$-12 \quad -12$$

$$\boxed{-10 = b}$$

$$y = mx + b$$

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

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

Option #1

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

$$y - (-2) = -\frac{1}{2}(x - 8)$$

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

$$-2 \qquad -2$$

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

Option #2

$$y = mx + b$$

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

$$-2 = -4 + b$$

$$+4 \quad +4$$

$$2 = b$$

$$y = mx + b$$

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

Find the equation for a line through the points $(2, 8)$ and $\boxed{(3, -2)}$

1.) Find slope

2.) Find the equation

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 8}{3 - 2} = \frac{-10}{1} = -10 \qquad m = -10$$

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

$$y - 8 = -10(x - 2)$$

$$y - 8 = -10x + 20$$

$$+8 \qquad +8$$

$$\boxed{y = -10x + 28}$$

$$y = mx + b$$

$$-2 = (-10)(3) + b$$

$$-2 = -30 + b$$

$$+30 \quad +30$$

$$28 = b$$

$$y = mx + b$$

$$\boxed{y = -10x + 28}$$