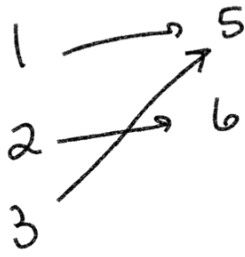
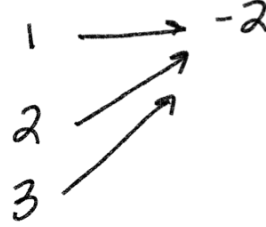


Input Output



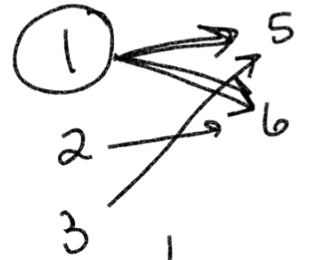
function

Input Output



function

Input Output

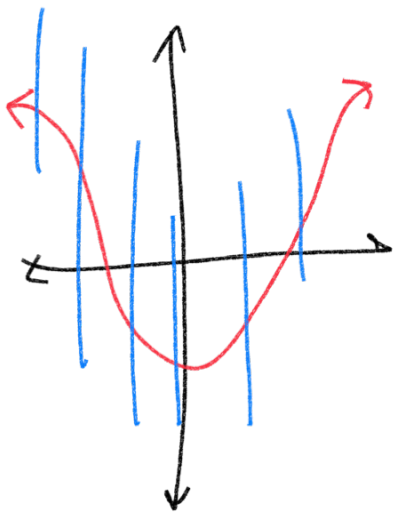


not function

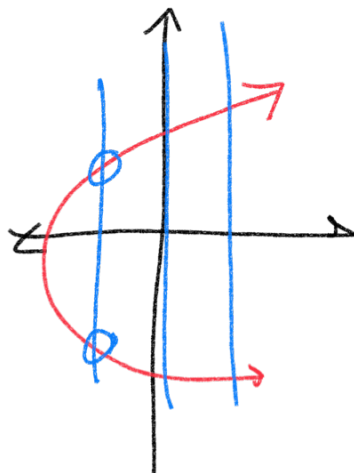
Domain: x values

Range: y values

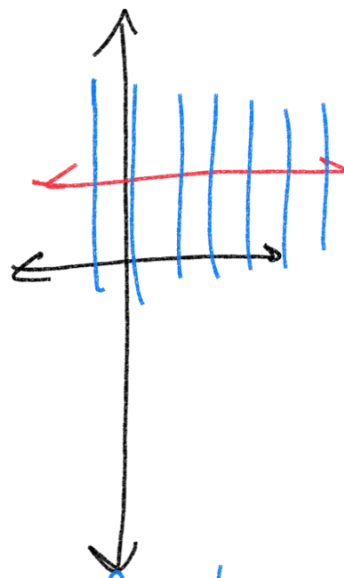
vertical line test



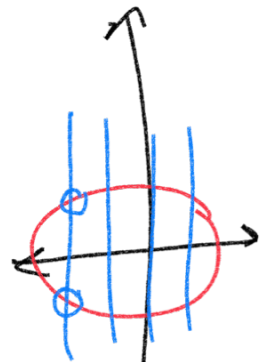
function



not function



function



not function

$$f(x) = -3x + 7$$

$$f(-2) = -3(-2) + 7 = (6) + 7 = (13)$$

linear equation

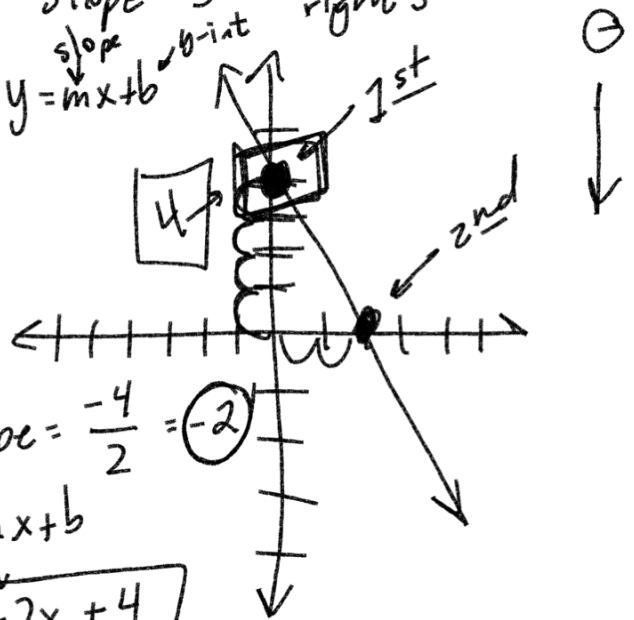
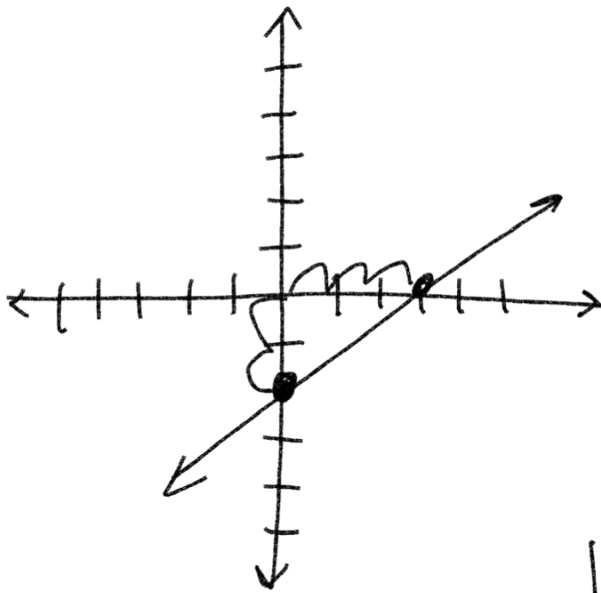
$$y = mx + b$$

$$\text{slope} = \frac{2}{3}$$

$$y\text{-int} = -2$$

$$y = \left(\frac{2}{3}\right)x - 2$$

slope  $\frac{2}{3}$  → up 2 right 3  
y = mx + b  
b-int



$$\text{slope} = \frac{-4}{2} = (-2)$$

$$y = mx + b$$

$$y = -2x + 4$$

$m = 3$  through point  $(-2, 4)$

Find linear equation

slope-intercept  
 $y = mx + b$

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

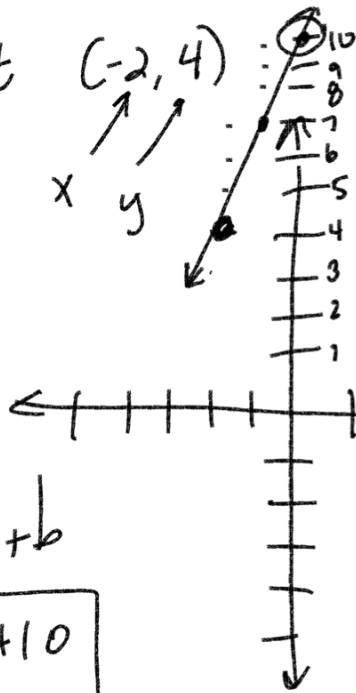
$$4 = -6 + b$$

$$+6 \quad +6$$

$$10 = b$$

$$y = mx + b$$

$$y = 3x + 10$$



$$y = 3x + 10$$

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

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

$$y - 4 = 3x + 6$$

$$+4 \quad +4$$

$$y = 3x + 10$$

Standard Form

$$Ax + By = C$$

$$3x + 4y = 12$$

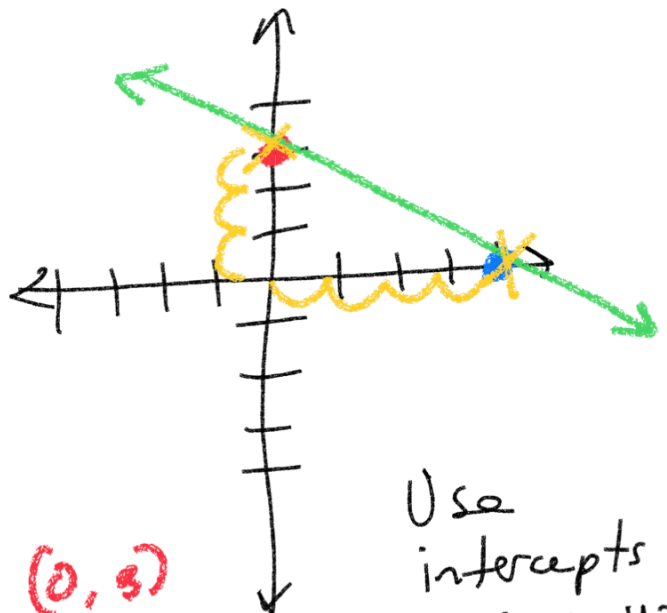
Convert into slope-int form

$$3x + 4y = 12$$

$$-3x \quad -3x$$

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

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



$$3x + 4y = 12$$

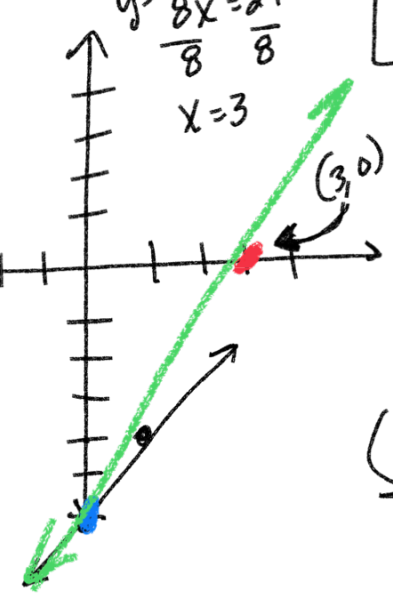
$$3x + 4y = 12$$

Use intercepts  
 $x = 0 \quad y = ?$   
 $x = ? \quad y = 0$

①  $8x - 4y = 24$   
 $-8x$   
 $8x - 4y = 24$   
 $-4y = -8x + 24$   
 $\frac{-4y}{-4} = \frac{-8x + 24}{-4}$   
 $y = 2x - 6$

②  $2x + 6y = -18$   
 $-2x$   
 $2x + 6y = -18$   
 $-2x$   
 $6y = -2x - 18$   
 $\frac{6y}{6} = \frac{-2x - 18}{6}$

$8x = 24$   
 $x = 3$

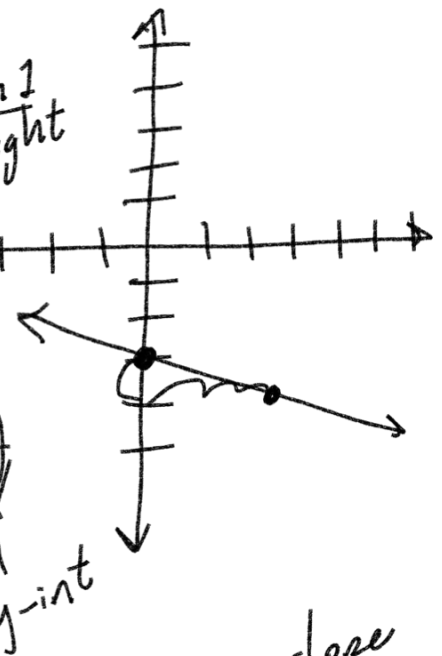


$-4y = 24$   
 $y = -6$

down 1  
3 right

rise  
run

$y = \frac{-1}{3}x - 3$   
 y-int

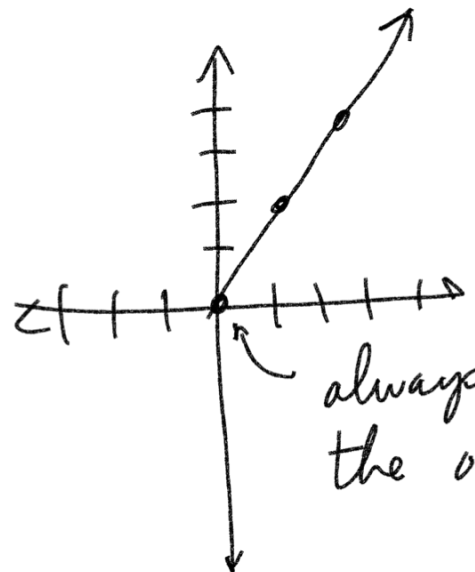


2-3 Direct Variation

$y = mx + b$  ←  $b = 0$

$y = kx$   
 ← slope

$k = \text{constant of variation}$

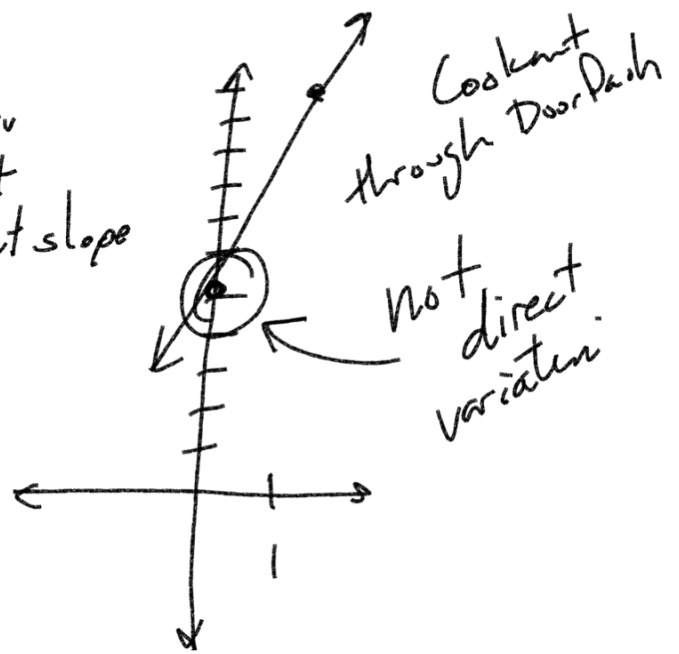
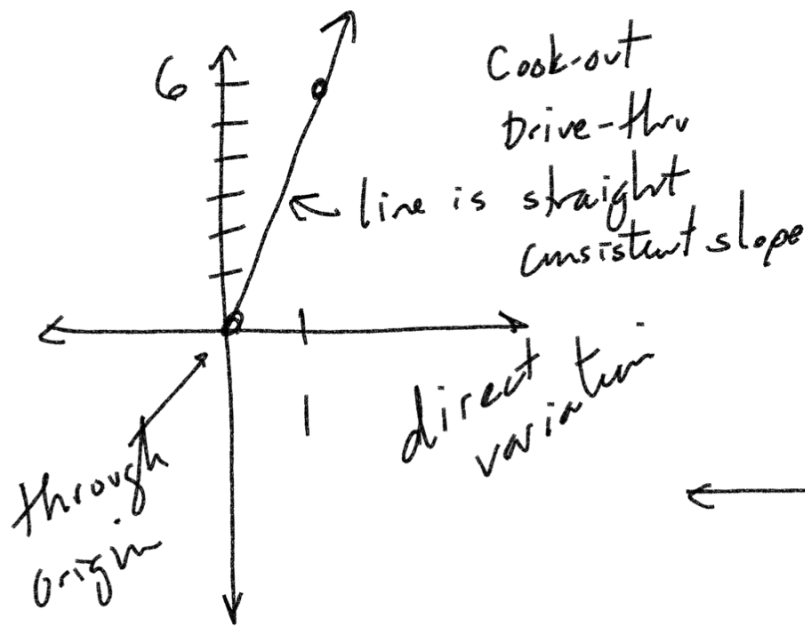


$y = 2x$

always crosses at the origin

$y = 3x + 4$

NOT DIRECT VARIATION



input  $\rightarrow$  output for direct variation

If  $y = 8$ , when  $x = 4$

find  $y$  when  $x = 6$

$$y = 2(6)$$

$$y = 12$$

$$y = kx$$

$$8 = k(4)$$

$$\frac{8}{4} = \frac{4k}{4}$$

$$2 = k$$

$$\underline{\underline{y = 2x}}$$

If  $y = 9$  when  $x = 3$

$y = 7$      $x = ?$

$$y = kx$$

$$9 = \frac{(k)(3)}{3}$$

$$3 = k$$

$$y = 3x$$

$$\frac{7}{3} = \frac{3x}{3}$$

$$\boxed{\frac{7}{3} = x}$$

|                   | x  | y  | $\frac{y}{x}$   | k |
|-------------------|----|----|-----------------|---|
| 1 <sup>st</sup> → | -1 | -3 | $\frac{-3}{-1}$ | 3 |
| 2 <sup>nd</sup> → | 1  | 3  | $\frac{3}{1}$   | 3 |
| 3 <sup>rd</sup> → | 3  | 9  | $\frac{9}{3}$   | 3 |

$$y = kx$$

if direct variation,  
k will always be  
the same

direct variation

$$y = 3x$$

$$\frac{y}{x} = \frac{kx}{x}$$

$$\left[ k = \frac{y}{x} \right]$$

Write an equation for a direct variation

through

$(3, -5)$   
 x y

$$k = \frac{-5}{3}$$

$$y = kx$$

$$k = \frac{y}{x}$$

$(0,0)$

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

nothing due!

Quiz 8  
 due Nov 11<sup>th</sup>

HW  
 2-3 evens  
 supplemental WS (2-2)  
 Online HW 9 (Sat)  
 Quiz 9 (Sat)  
 due Nov 18<sup>th</sup>

