

I can : Solve and graph linear functions

2.2 2.3

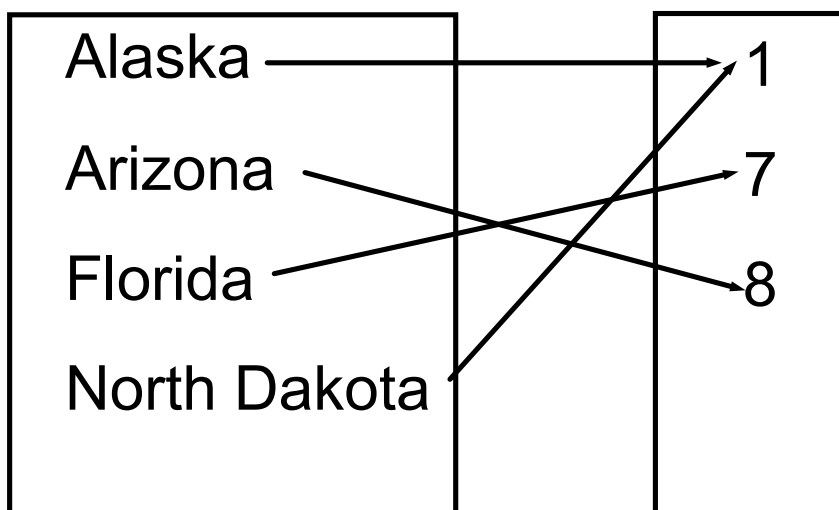
Relation: Correspondence between 2 sets where each member of the 1st set corresponds with *at least* one member of the 2nd set

Function: is a "special type" relation

ex. of functions

- each person in class to a date of birth
- barcode to a price
- real number to the square of that number

mapping (still a relation)



(Alaska, 1) (Arizona, 8) (Florida, 7) (N.D., 1)

Function: a relation that associates each element of X to exactly one element of Y

Domain

Range

Input

Output

x-value

y-value

Independent

Dependent

Argument

X value can NEVER repeat in order for it to be a function

Find the domain and range
then tell if it is a function or not

$(-3,3)$ $(-2, 5)$ $(0,9)$ $(4, -10)$

domain:

range

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

domain

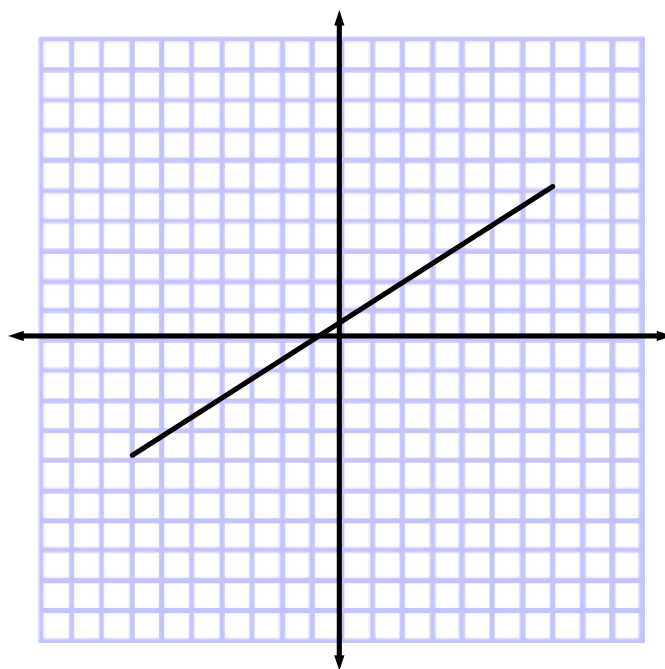
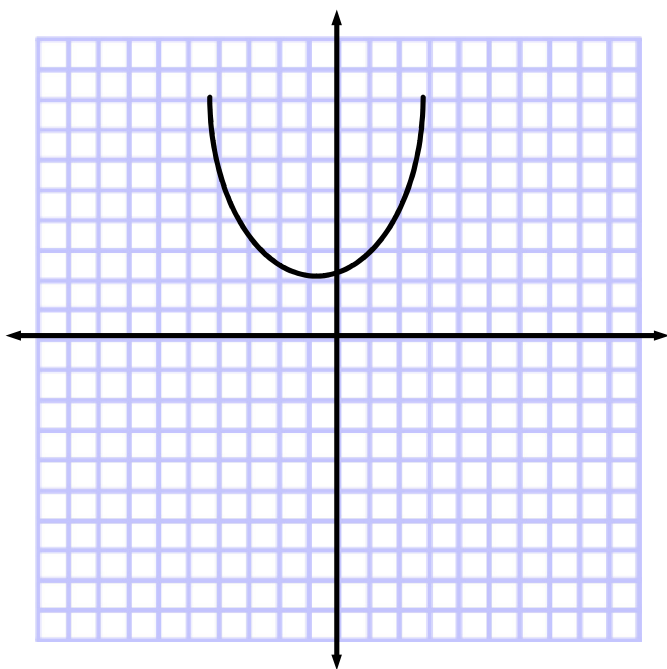
range

$(3, .4)$ $(3, -2)$ $(3, 5/2)$

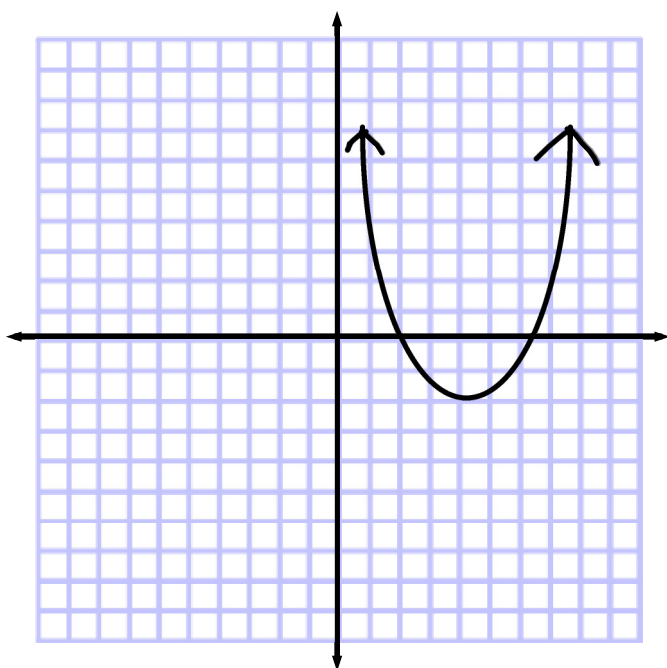
domain

range

show the YouTube video on domain and range



find the domain and range of both graphs



Find the domain and range

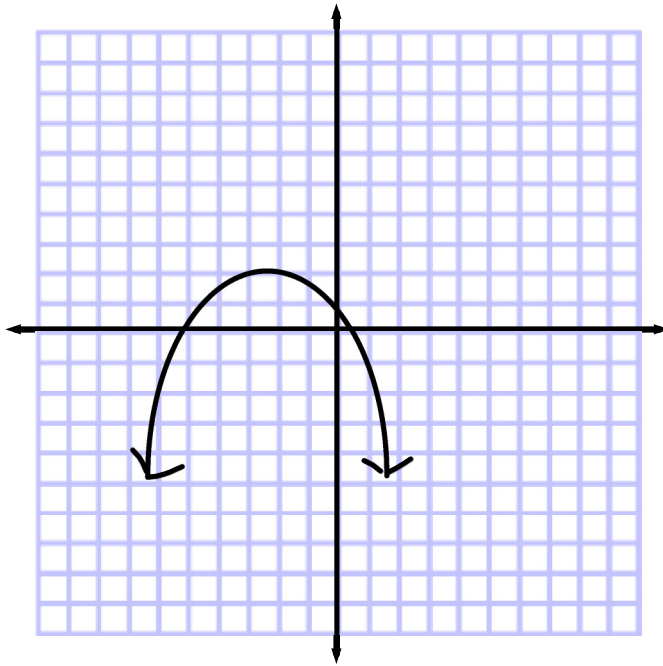
Find the function

$$g(x) = \frac{x - 3}{2x - 5}$$

$$g(4)$$

$$g(x + 2)$$

$$g(-1)$$



Find $f(x) = 2$
and $f(-6)$

2.3 linear graphs, slopes, and models

Slope Intercep Form: $y = mx + b$

Standard Form: $Ax + By = C$

Slope: Rise/Run $m = \frac{y_2 - y_1}{x_2 - x_1}$

Parallel lines have EQUAL slopes

Perpendicular lines have slopes that MULTIPLY to equal -1

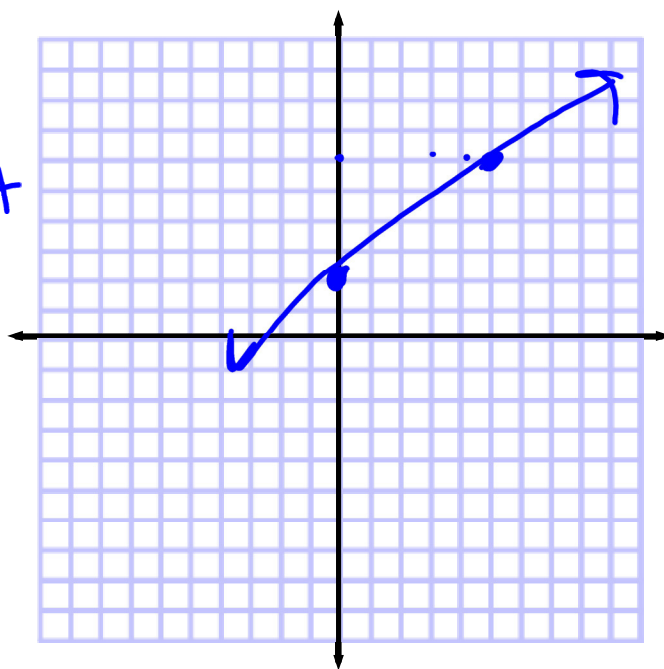
$$f(x) = mx + b$$

$$y = mx + b$$

$$h(x) = \frac{4}{5}x + 2$$

$m = \frac{4}{5} \rightarrow$ up/down
 \rightarrow right/left

$$b = (0, 2)$$



Identify the y-intercept

$$g(x) = -x - 1$$

$$b = -1 \\ (0, -1)$$

Find the slope

$(\underline{-4}, -5)$ and $(\underline{-8}, \underline{3})$
 x_1, y_1 x_2, y_2

$$m = \frac{3 - (-5)}{-8 - (-4)} = \frac{8}{-4} = \boxed{-2}$$

Identify the slope and y-intercept

$$y = \frac{-1}{3}x - 2$$

$$m = -\frac{1}{3}$$

$$b = (0, -2)$$

$$\begin{array}{r} 4x + 5y = 8 \\ -4x \quad -4x \\ \hline 5y = -4x + 8 \end{array}$$

$$y = \left(-\frac{4}{5}\right)x + \frac{8}{5}$$

$$m = -\frac{4}{5}$$

$$b = \left(0, \frac{8}{5}\right)$$

Find a linear function given the slope is 2
and the y-intercept is (0,5)

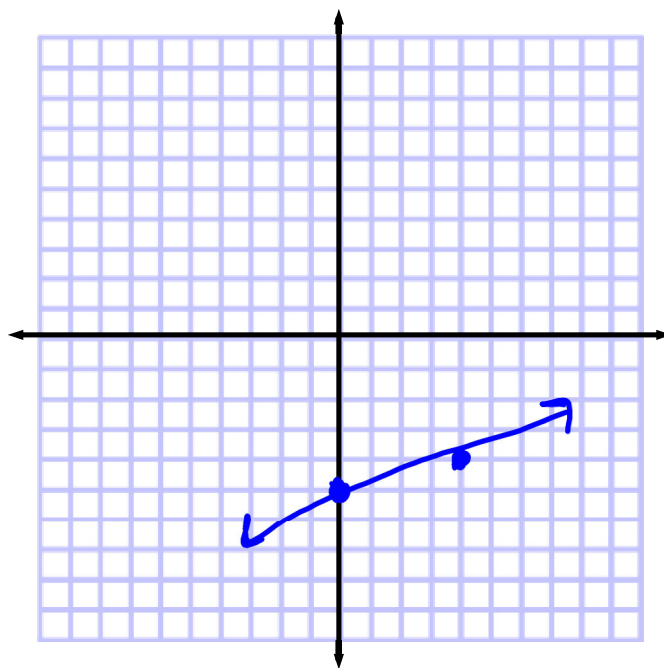
$$m = 2$$
$$b = 5$$

$$y = mx + b$$
$$y = 2x + 5$$

Determine the slope and then graph

$$\begin{array}{r} 4y + 20 = x \\ -20 \quad -20 \\ \hline 4y = x - 20 \\ \frac{4y}{4} = \frac{x - 20}{4} \\ y = \frac{1}{4}x - 5 \end{array}$$

$m = \frac{1}{4}$
 $b = (0, -5)$



2.4 more on linear graphs

Determine if the lines are parallel
perpendicular or neither

$$y + 9 = 3x$$

$$3x - y = -2$$

Determine if the lines are parallel
perpendicular or neither

$$x - 2y = 3$$

$$4x + 2y = 1$$

Find the x and y intercepts

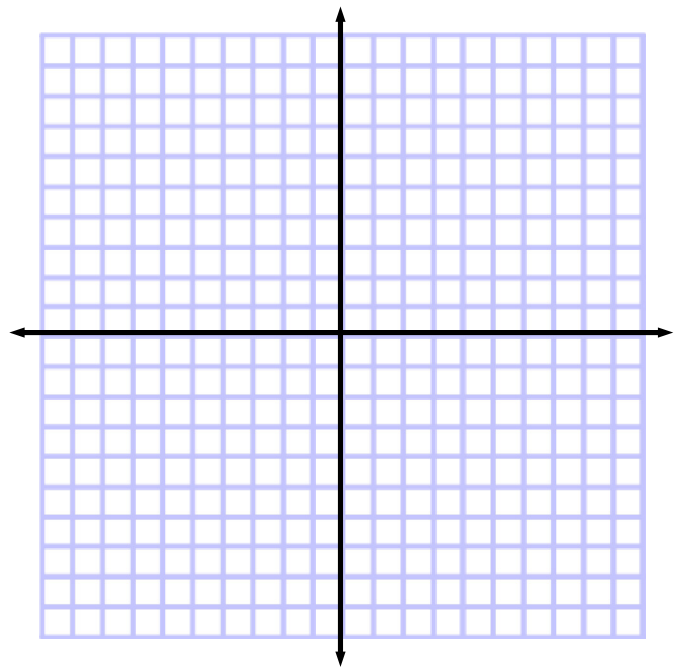
$$5x - 4y = 20$$

Solve graphically

$$\frac{1}{2}x + 3 = 2$$

$$f(x) = \frac{1}{2}x + 3$$

$$g(x) = 2$$



Horizontal lines have a ZERO slope

$$y = 3$$

$$f(x) = -2$$

Vertical lines have an UNDEFINED slope

$$x = 4$$