

I can : Solve and graph linear functions

2.2 2.3

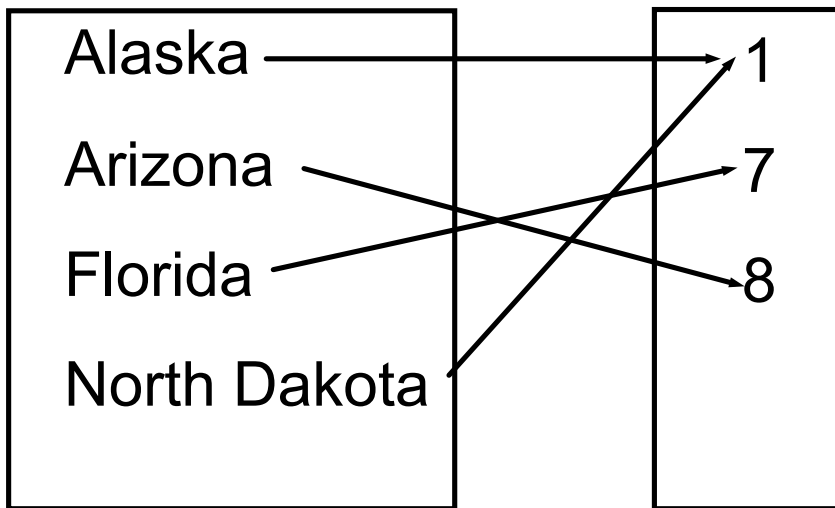
Relation: Correspondence between 2 sets where each member of the 1st set corresponds with *at least* one member of the 2nd set

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

$(\text{Dan, Apr}) (\text{Dan, July})$

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

yes

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

domain: $(-3, -2, 0, 4)$

range $(3, 5, 9, -10)$

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

yes

domain $\{-2, 1, 2\}$

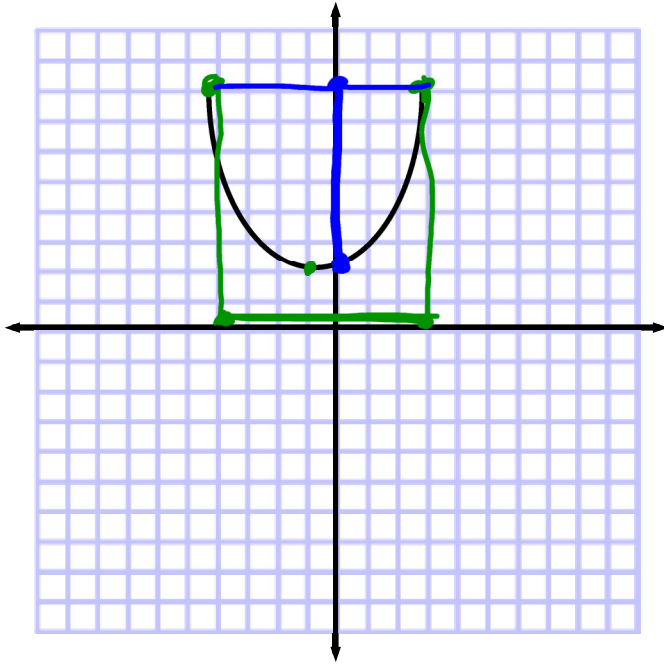
range $\{1, 1, 1\}$

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

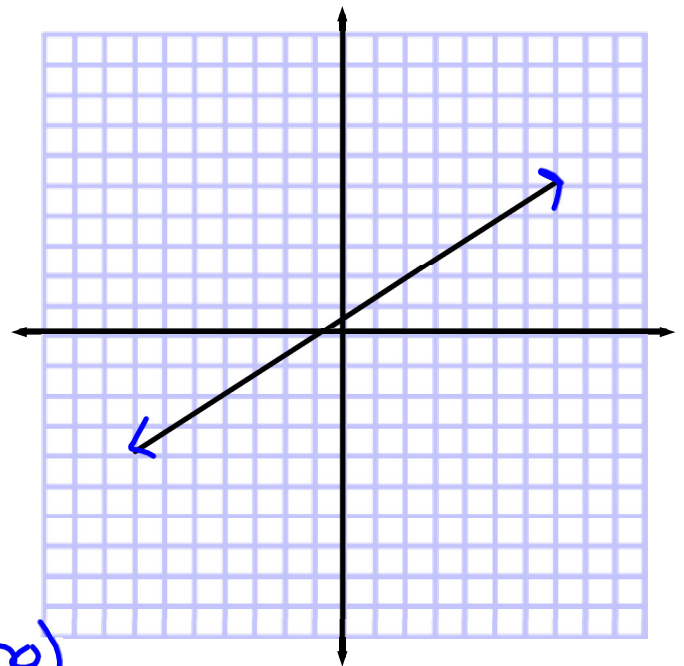
domain $\{3, 3, 3\}$ NO

range $\{4, -2, 5/2\}$

show the YouTube video on domain and range



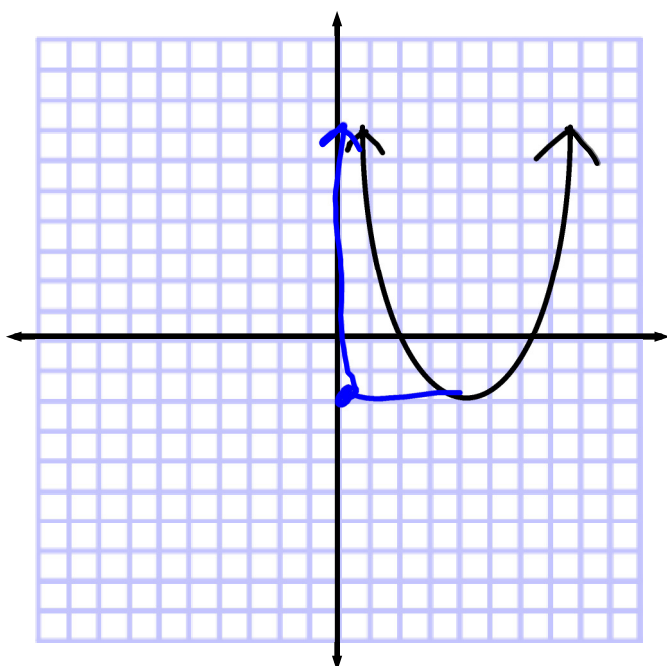
$D: [-4, 4]$
 $R: [2, 8]$



find the domain and range of both graphs

\mathbb{R}

$D: (-\infty, \infty)$
 $R: (-\infty, \infty)$



$$D: \{x \mid x \in \mathbb{R}\}$$
$$R: \{y \mid y \geq -2\}$$

Find the domain and range

Find the function

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

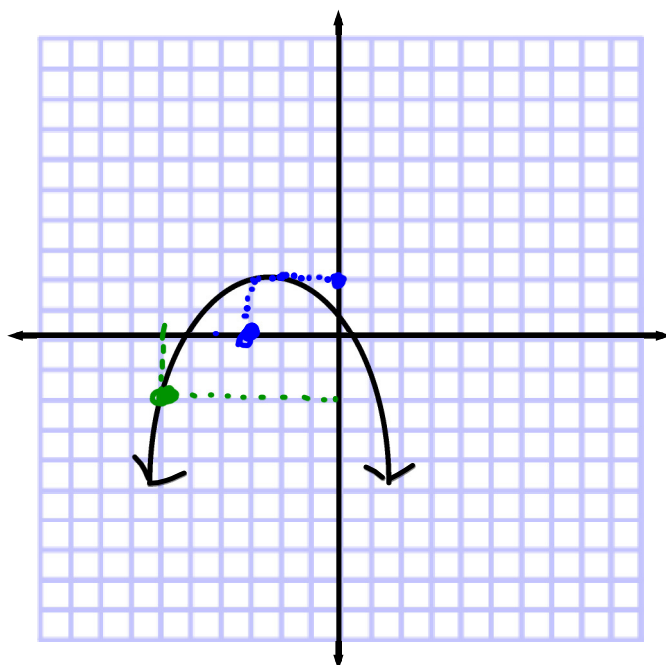
$$\begin{aligned}
 &= 4 - 3 \\
 &= \frac{2(4) - 3}{8 - 5} \\
 &= \boxed{\frac{1}{3}}
 \end{aligned}$$

$$g(4) = \text{input} \rightarrow \text{output}$$

$$g(x + 2)$$

$$g(-1)$$

$$\begin{aligned}
 &\frac{(x+2) - 3}{2(x+2) - 5} \\
 &= \frac{x - 1}{2x - 1}
 \end{aligned}$$



Find $f(x) = 2$ → output -3
and $f(-6)$ → -2

2.3 linear graphs, slopes, and models

Slope Intercep Form: $y = mx + b$

Standard Form: $Ax + By = C$

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

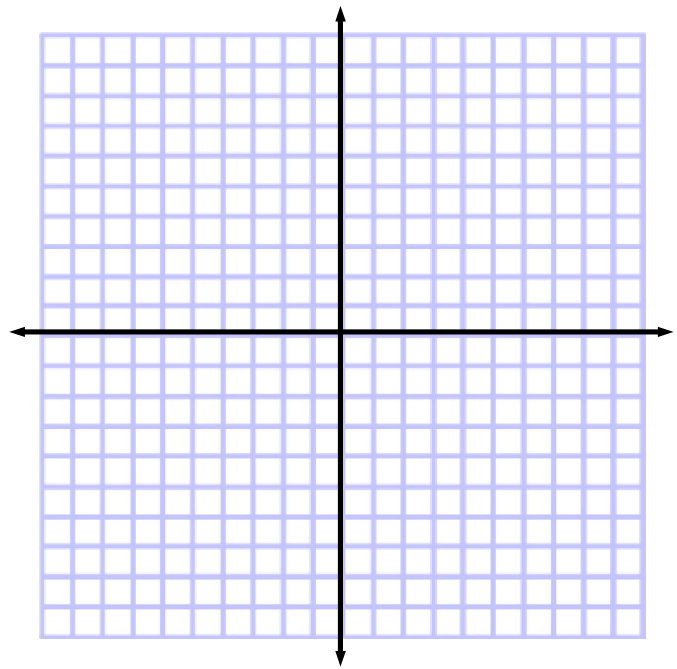
Parallel lines have EQUAL slopes

Perpendicular lines have slopes that MULTIPLY to equal -1

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

$$y = mx + b$$

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



Identify the y-intercept

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

Find the slope
 $(-4, -5)$ and $(-8, 3)$

Identify the slope and y-intercept

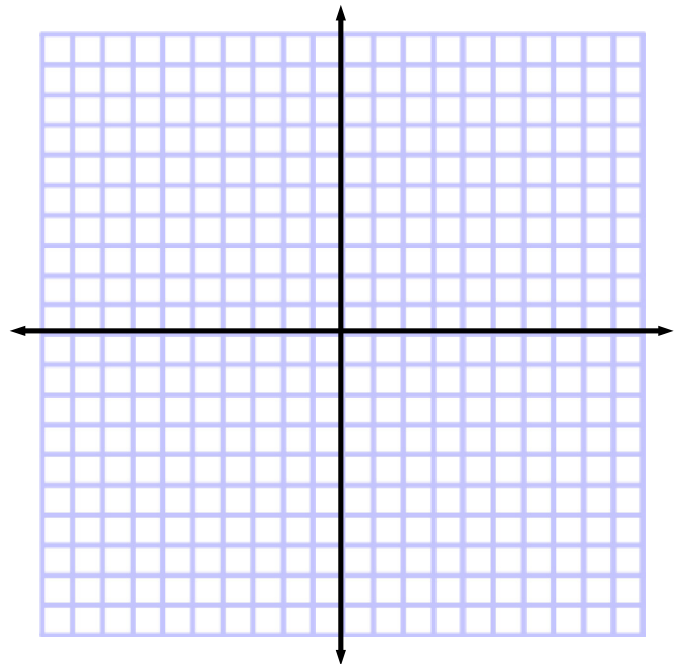
$$y = \frac{-1}{3}x - 2$$

$$4x + 5y = 8$$

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

Determine the slope and then graph

$$4y + 20 = x$$



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

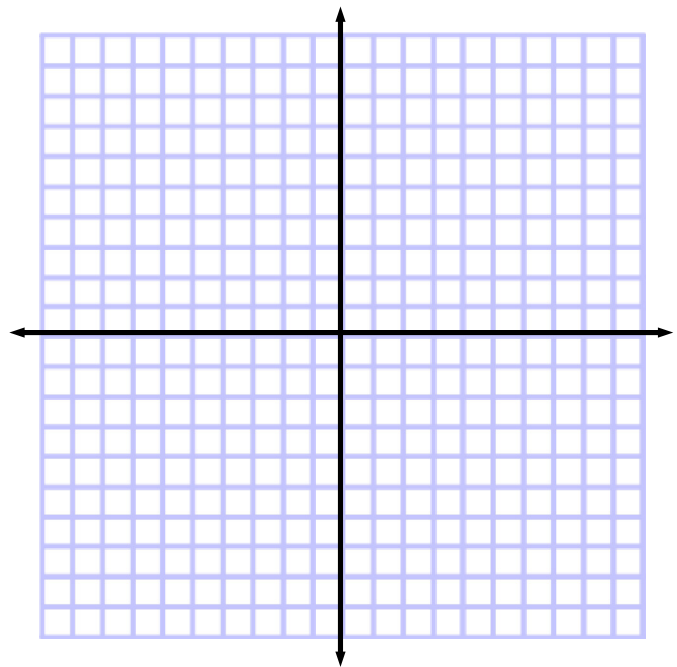
$$5x - 4y = 20$$

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

$$x = 4$$