



Domain and Range

Video Notes

[Video Link](#)

This video is an intro to

Domain and Range

Background Knowledge:

- What is a function?
- Examples and Nonexamples of Functions
- Solving Quadratic Equations

Definitions:

Domain	Range
The set of all inputs (x-values/ independent values) that satisfy a relation.	The set of all outputs (y-values/ dependent values) that satisfy the relation and the domain defined by it.

What is the difference between continuous and discrete values?

Continuous	Discrete
<p><u>any</u> value within an interval (no spaces)</p> <p>Ex: $-4 \leq x \leq 2$</p> <p>$-3.914, 0, 1.\bar{3}, 1.278496, 1.9999$</p>	<p>values are separated (holes b/t the values)</p> <p>Ex: $-4 \leq x \leq 2 \rightarrow$ integers</p> <p>$-4, -3, -2, -1, 0, 1, 2$</p>

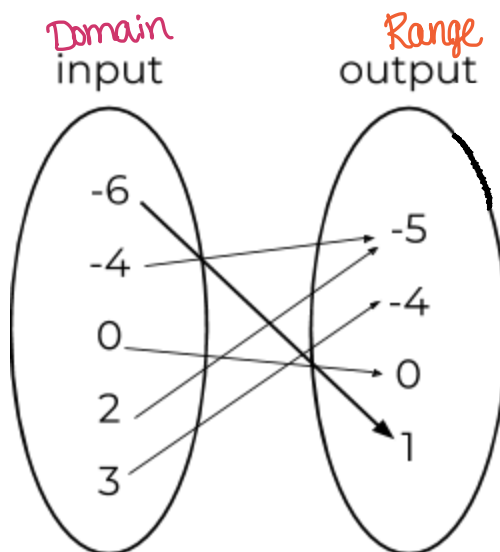
Determine the domain and range of each relation below:

$$\{(-5, 2), (3, 7), (14, -9), (5, -1)\}$$

Domain \rightarrow inputs (x)
Range \rightarrow outputs (y)

Domain: $\{-5, 3, 5, 14\}$

Range: $\{-9, -1, 2, 7\}$



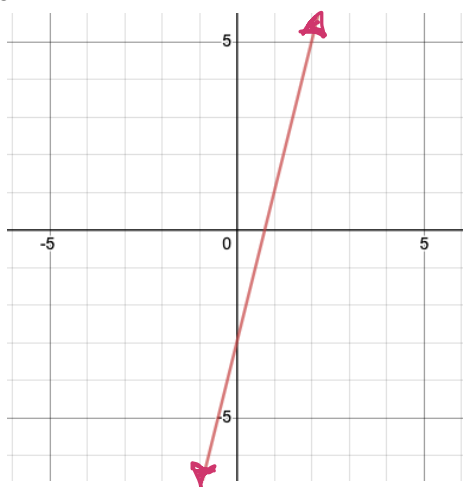
Domain: $\{-6, -4, 0, 2, 3\}$

Range: $\{-5, -4, 0, 1\}$

Determine the domain and range of each relation below:

(Inputs) (Outputs)

$y = 4x - 3$ - linear function



$y = 4x - 3$

Are there any x -values that won't work?

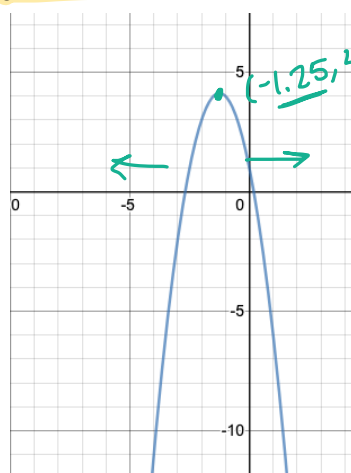
Domain: $\{x \in \mathbb{R}\}$

(x is an element of the reals)
 x can be any number

$(-\infty, \infty)$

Range: $\{y \in \mathbb{R}\}$

$y = -2x^2 - 5x + 1$



Tip: When finding domain, sometimes it's easier to ask: "What doesn't work for x ?"

Domain: $\{x \in \mathbb{R}\}$

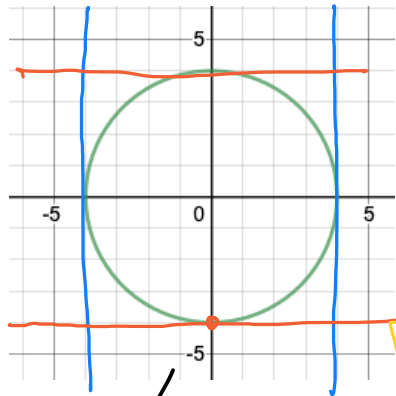
$(-\infty, \infty)$

Range:

$\{y \in \mathbb{R} \mid y \leq 4.125\}$

$(-\infty, 4.125]$

$$x^2 + y^2 = 16 \text{ - circle } r = \sqrt{16} = 4$$



Domain:

$$\{x \in \mathbb{R} \mid -4 \leq x \leq 4\}$$

$$[-4, 4]$$

Range:

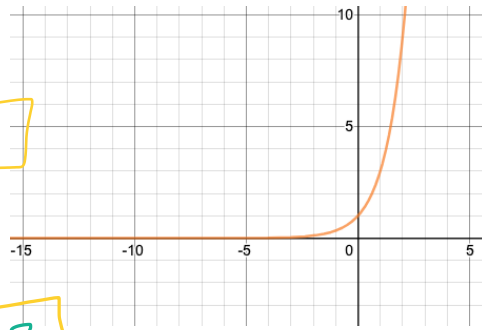
$$\{y \in \mathbb{R} \mid -4 \leq y \leq 4\}$$

$$[-4, 4]$$

$$y = 3^x \rightarrow$$

$$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$$

$3^x \rightarrow$ positive



$$\text{Domain: } \{x \in \mathbb{R}\} \\ (-\infty, \infty)$$

$$\text{Range: } \{y \in \mathbb{R} \mid y > 0\} \\ (0, \infty)$$

~~$x^2 + y^2 = 16$~~
 ~~$5^2 + y^2 = 16$~~
 ~~$25 + y^2 = 16$~~
 ~~$y^2 = -9$~~