



Math Virtual Learning

College Prep Algebra

May 14, 2020



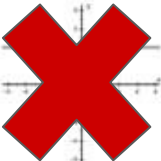
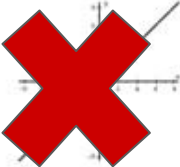
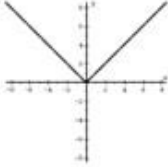
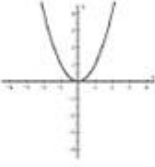
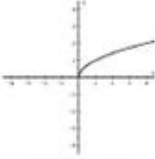
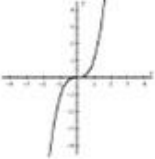
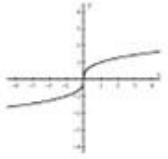
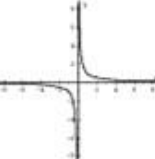
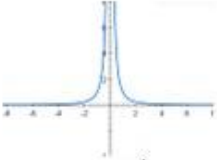
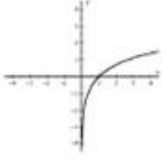
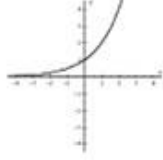
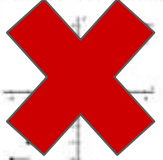
College Prep Algebra

Lesson: May 14, 2020

Objective/Learning Target:

- I can determine the Domain and Range of each parent function

Let's get started:

<p>Constant</p>  <p>$f(x) = c$</p>	<p>Linear</p>  <p>$f(x) = x$</p>	<p>Absolute Value</p>  <p>$f(x) = x$</p>	<p>Quadratic</p>  <p>$f(x) = x^2$</p>
<p>Square Root</p>  <p>$f(x) = \sqrt{x}$</p>	<p>Cubic</p>  <p>$f(x) = x^3$</p>	<p>Cube Root</p>  <p>$f(x) = \sqrt[3]{x}$</p>	<p>Reciprocal/Inverse/ Rational</p>  <p>$f(x) = \frac{1}{x}$</p>
<p>Rational</p>  <p>$f(x) = \frac{1}{x^2}$</p>	<p>Logarithmic</p>  <p>$f(x) = \ln(x)$</p>	<p>Exponential</p>  <p>$f(x) = e^x$</p>	<p>Greatest Integer (Step Function)</p>  <p>$f(x) = [[x]]$</p>

These are Parent Functions.

You should be familiar with them from completing Algebra 2 and from the Lesson on May 13.

Check your “Graph Memory” by completing this activity.

[Do you know your Parent Functions?](#)

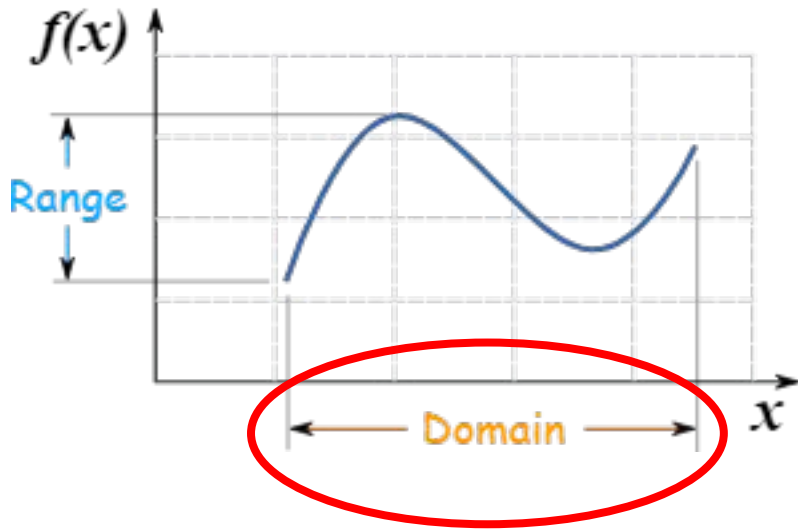
- *Click the link*
- *Enter your first name*
- *Continue without signing in*
- *Click Join*

Lesson:

**Did you had difficulty completing
“Do you know your Parent Functions? Marble Slides”?**

**Here is the link to May 13 activity that you used to
reconnect with parent functions and their graphs. Click
on it again to refamiliarize yourself with the graphs.**

[What Parent Functions should I know?](#)



In Mathematics we want to know which numbers will and will not work as an Input of a function.

When we identify the numbers that will and will not work as inputs, we are identifying the DOMAIN of the function.

Looking at the graphs of Parent Functions can be very helpful in defining the DOMAIN of the functions.

The next few slides will help you define the DOMAIN for the Parent Functions.

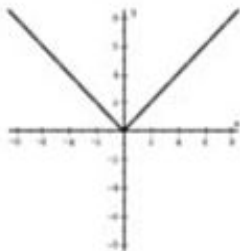
Each of these parent functions have a DOMAIN of “All Real Numbers”

What that means is that **you can use any number in the universe in these functions and you will always get an output or answer!**

Notice the graphs read all the way across, both left and right, and go on forever! That also means the

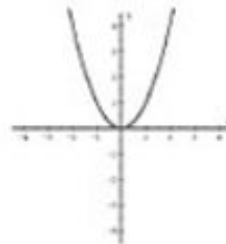
**DOMAIN is
“All Real Numbers”.**

Absolute Value



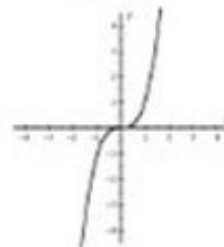
$$f(x) = |x|$$

Quadratic



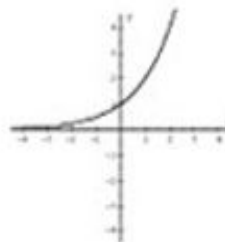
$$f(x) = x^2$$

Cubic



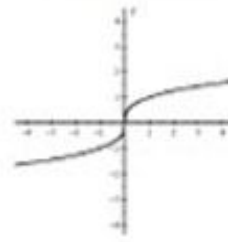
$$f(x) = x^3$$

Exponential



$$f(x) = e^x$$

Cube Root



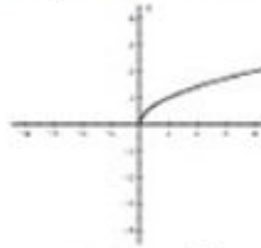
$$f(x) = \sqrt[3]{x}$$

Notice these graphs do NOT read continuously across?

- **Square Root**—starts when $x = 0$
- **Logarithmic**—no negative values for x and no value when $x = 0$
- **Rationals**—do not show any graph when $x = 0$. It's all to the left and all to the right of $x = 0$

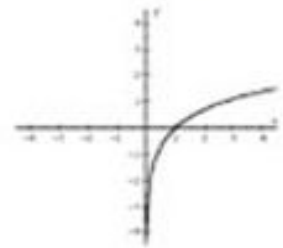
The next slide shows how you would write the DOMAIN for these functions

Square Root



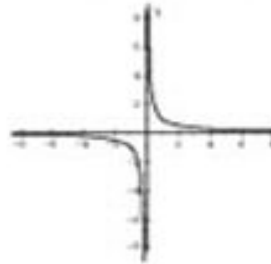
$$f(x) = \sqrt{x}$$

Logarithmic



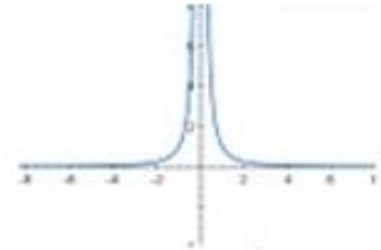
$$f(x) = \ln(x)$$

Reciprocal/Inverse/
Rational



$$f(x) = \frac{1}{x}$$

Rational



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

DOMAIN

Verbal and symbolic

Square Root

- All real numbers equal to or greater than 0.
- $x \geq 0$

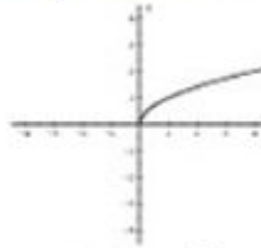
Logarithmic

- All real numbers greater than 0
- $x > 0$

Rationals

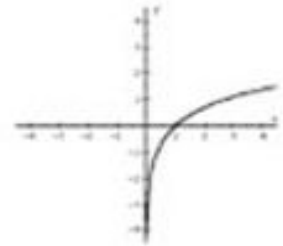
- All real numbers except for 0
- $x \neq 0$

Square Root



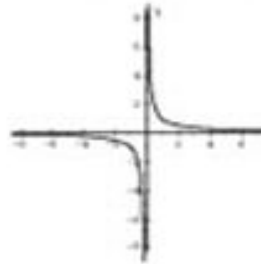
$$f(x) = \sqrt{x}$$

Logarithmic



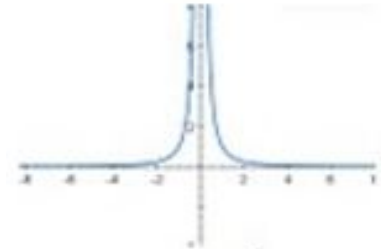
$$f(x) = \ln(x)$$

Reciprocal/Inverse/ Rational

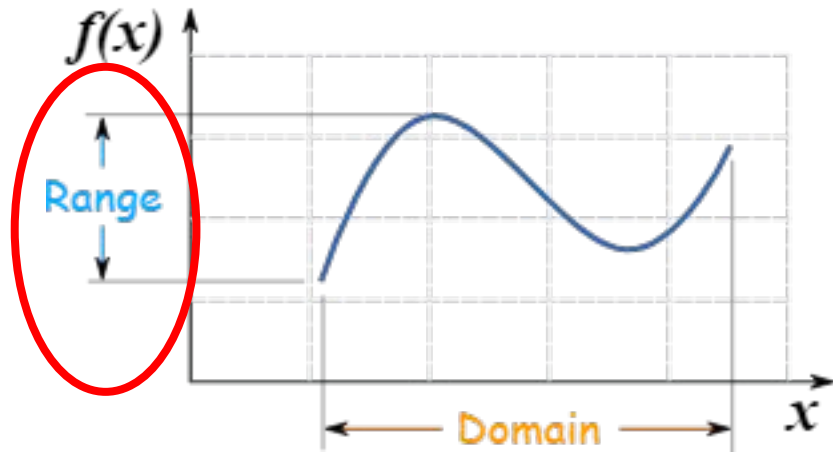


$$f(x) = \frac{1}{x}$$

Rational



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



In Mathematics we want to know which numbers will and will not be created as Outputs

When we identify the numbers that will and will not work be created as outputs, we are identifying the RANGE of the function.

Looking at the graphs of Parent Functions can be very helpful in defining the RANGE of the functions.

The next few slides will help you define the RANGE for the Parent Functions.

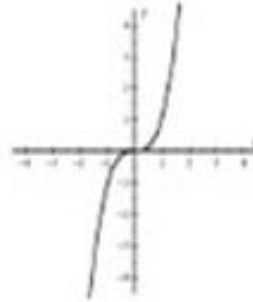
Each of these parent functions have a RANGE of “All Real Numbers”

What that means is that **every number in the universe can be created as an Output but the function.**

Notice the graphs read all the way vertically, both up and down, and go on forever! That also means the

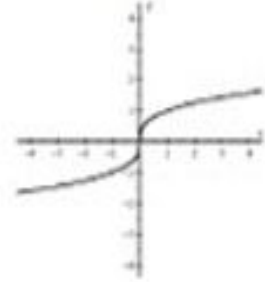
**RANGE is
“All Real Numbers”.**

Cubic



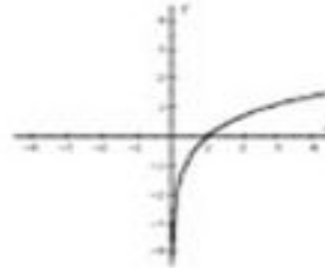
$$f(x) = x^3$$

Cube Root



$$f(x) = \sqrt[3]{x}$$

Logarithmic



$$f(x) = \ln(x)$$

Notice these graphs do NOT read continuously up and down?

Quadratic, Absolute Value, Square Root, all have 0 as the lowest value of the y and then all of the positive y values are there.

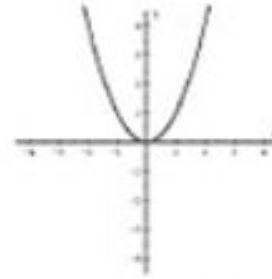
RANGE

Verbal and Symbolic

Quadratic, Absolute Value, Square Root

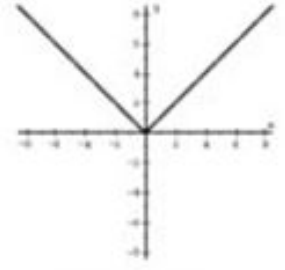
- All reals greater than or equal to 0
- $y \geq 0$

Quadratic



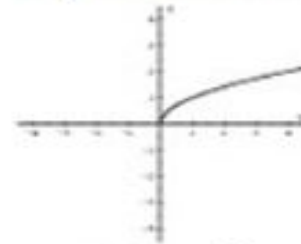
$$f(x) = x^2$$

Absolute Value



$$f(x) = |x|$$

Square Root



$$f(x) = \sqrt{x}$$

Notice these graphs do NOT read continuously up and down?

Rational (even powered) and Exponential both have values greater than $y = 0$

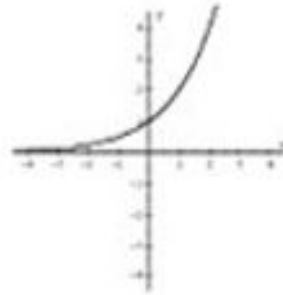
RANGE

Verbal and Symbolic

Rational and Exponential

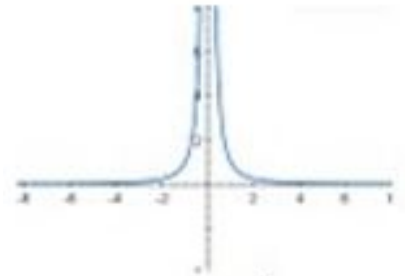
- All reals greater than 0
- $y > 0$

Exponential



$$f(x) = e^x$$

Rational



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

Notice this graph does NOT read continuously up and down?

Rational/Inverse has all values of y EXCEPT for $y = 0$

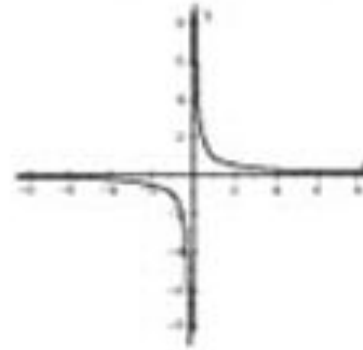
RANGE

Verbal and Symbolic

Rational/Inverse

- All real numbers EXCEPT for $y = 0$
- $y \neq 0$

Reciprocal/Inverse/
Rational



$$f(x) = \frac{1}{x}$$

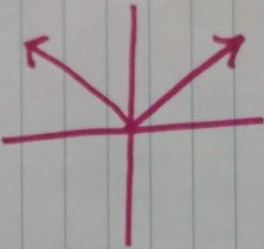
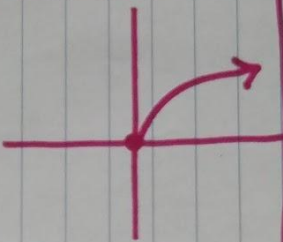
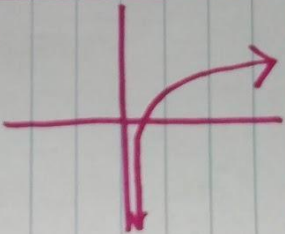
Practice:

Organize the Parent Functions showing the

- ❑ Name of the Function
- ❑ Equation of the Function
- ❑ Graph of the Function
- ❑ Domain of the Function
- ❑ Range of the Function

Do this on notebook paper for you to reference for the remainder of the lessons.

(See the next slide for an example)

Name	Rule	Graph	"x, values" Domain	"y values" Range
Absolute Value	$y = x $		All Real Numbers	$y \geq 0$
Square Root	$y = \sqrt{x}$		$x \geq 0$	$y \geq 0$
Logarithm	$y = \log_2 x$		$x > 0$	All real Numbers

Extra help on Domain and Range

Add video to Khan Academy here

<https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:functions/x2f8bb11595b61c86:introduction-to-the-domain-and-range-of-a-function/v/domain-and-range-from-graphs>