



Math Virtual Learning

College Prep Algebra

May 15, 2020



College Prep Algebra

Lesson: May 15, 2020

Objective/Learning Target:

- I can determine Range of a Parent Function when it has been shifted vertically

Lesson:

On May 14, you focused on determining the Domain and Range of each Parent Function.

Today, you will see how a Vertical Transformation will affect the Range of the function AND you will learn how to write the new Range.

The next 4 slides are a repeat of May 14 on Range—just to remind you of what we will be working with.

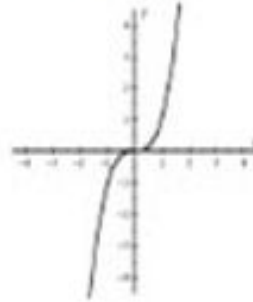
Each of these parent functions have a RANGE of “All Real Numbers”

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

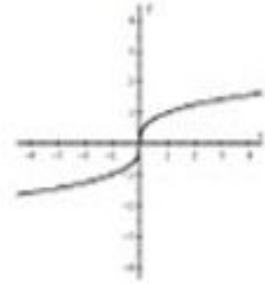
**RANGE is
“All Real Numbers”.**

Cubic



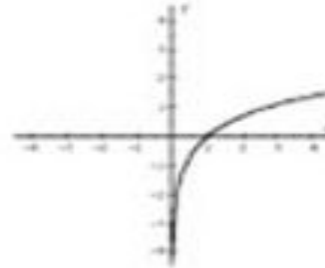
$$f(x) = x^3$$

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.

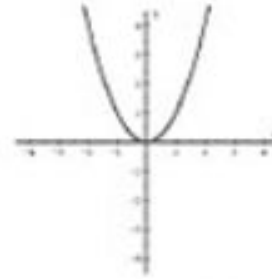
RANGE

Verbal and Symbolic

Quadratic, Absolute Value, Square Root

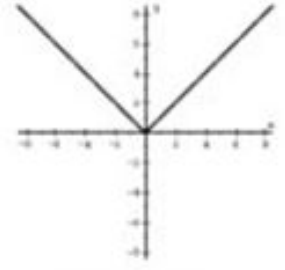
- All reals greater than or equal to 0
- $y \geq 0$

Quadratic



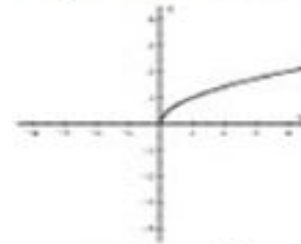
$$f(x) = x^2$$

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 $y = 0$

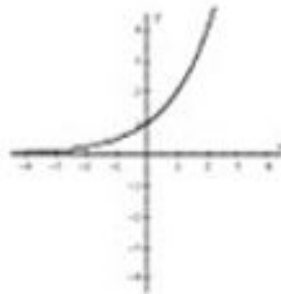
RANGE

Verbal and Symbolic

Rational and Exponential

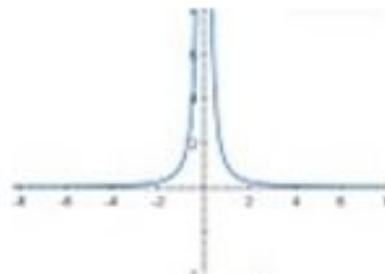
- All reals greater than 0
- $y > 0$

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 $y = 0$

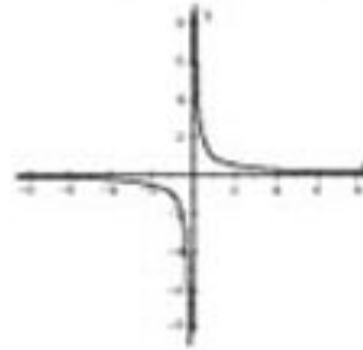
RANGE

Verbal and Symbolic

Rational/Inverse

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

Reciprocal/Inverse/
Rational



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

In Algebra 2, you learned how to use algebra to vertically shift Parent Functions.

Refresh your memory with this activity

[Parent Functions: Vertical Transformations](#)

Practice:

Create a Reference Sheet for Transformations

- ❑ How the Function is changed
- ❑ Change to the equation of the Function
- ❑ Change to Domain of the Function, if any
- ❑ Change to Range of the Function, if any

(See the next slide for an example)

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

