



Math Virtual Learning

# College Prep Algebra

May 20, 2020



## College Prep Algebra

### Lesson: May 20, 2020

#### **Objective/Learning Target:**

- I can write an equation to transform a parent function from a verbal description
- I can determine the Domain and Range of a transformed parent function from its equation.

## **Lesson:**

**From May 15 to May 19, you worked on**

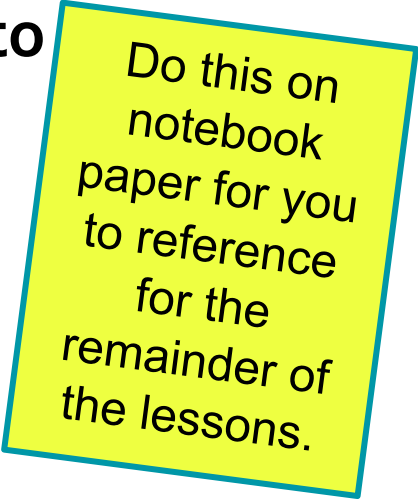
- **Parent Functions**
- **Horizontal Transformations**
- **Vertical Transformations**
- **Vertical Compressions and Stretches**
- **Horizontal Compressions and Stretches**
- **Reflections across the x-axis and y-axis**
- **Parent Function Domain and Range**

## Lesson:

During those lesson you were encouraged to create Reference Pages for

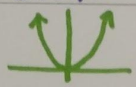
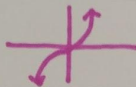

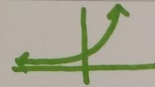
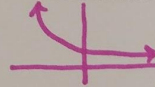

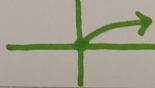
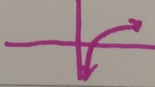
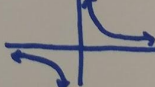

- Parent Functions
- Transformations.

The next two slides have examples of Reference Pages



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

# Parent Functions Reference Page

* Parent Functions *				
Equation	Name	Graph	Domain	Range
$f(x) = x^2$	Quadratic		All Reals	$y \geq 0$
$f(x) = x^3$	Cubic		All Reals	All Reals
$f(x) =  x $	Absolute Value		All Reals	$y \geq 0$
$f(x) = (2)^x$	Exponential Growth		All Reals	$y > 0$
$f(x) = (\frac{1}{2})^x$	Exponential Decay		All Reals	$y > 0$
$f(x) = \sqrt[3]{x}$	Cube root		All Reals	All Reals
$f(x) = \sqrt{x}$	Square Root		$x \geq 0$	$y \geq 0$
$f(x) = \log_2(x)$	Logarithmic		$x > 0$	All Reals
$f(x) = \frac{1}{x}$	Rational/Inverse		All Reals but $x \neq 0$	All Reals but $y \neq 0$
$f(x) = \frac{1}{x^2}$	Rational (even power)		All Reals but $x \neq 0$	$y > 0$

# Parent Functions Transformations Reference Page

* Transforming Parent Functions *			
Rule Change	Transformation	Domain Change	Range Change
$f(x) + k$	Vertical shift up "k" units	None	If <u>NOT</u> Reals, the 0 changes to "k"
$f(x) - k$	Vertical Shift down "k" units	None	If <u>NOT</u> Reals, the 0 changes to neg. "k"
$f(x-h)$	Horizontal Shift RIGHT "h" units	If <u>NOT</u> Reals, the 0 changes to "h"	None
$f(x+h)$	Horizontal Shift LEFT "h" units	If <u>NOT</u> Reals, the 0 changes to neg. "h"	None
$-f(x)$	Reflect across <del>positive</del> x-axis	None	If <u>NOT</u> Reals, the inequalities become $<$ or $\leq$
$f(-x)$	Reflect across y-axis	If <u>NOT</u> Reals, the inequalities become $<$ or $\leq$	None
$a \cdot f(x), a > 1$	Vertical Stretch	None	None
$f(a \cdot x), a < 1$	Horizontal Stretch	None	None
$a \cdot f(x), 0 < a < 1$	Vertical Compression	None	None
$f(a \cdot x), a > 1$	Horizontal Compression	None	None

**Practice:**

**Using your reference sheets as a guides, complete [this activity](#) on transformations of parent functions and the effects of transformations on Domain and Range.**