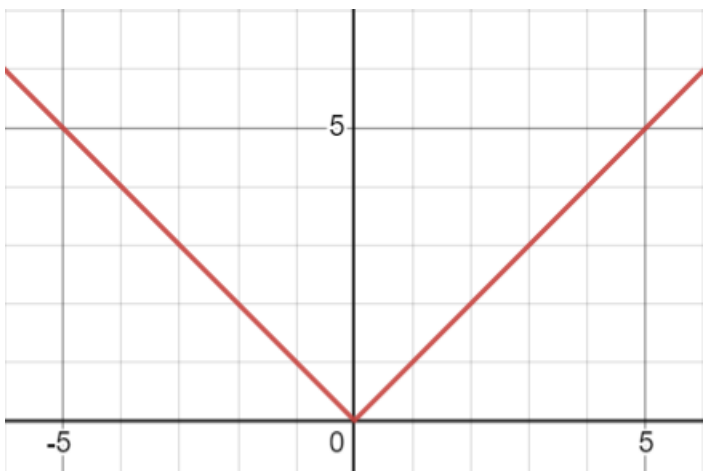
Types of Functions

There are several types of functions that you will learn in Algebra 1. This lesson will show you the graph of each and the parent equation that goes along with it.

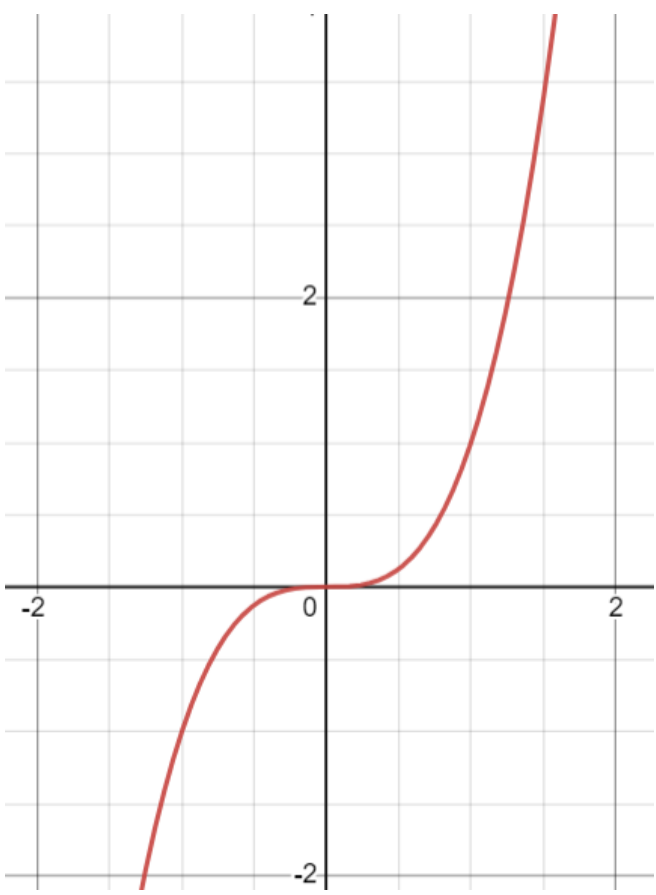
1) Absolute Value Functions



Parent Equation: y = |x|

Remember the V in Value for this graph!

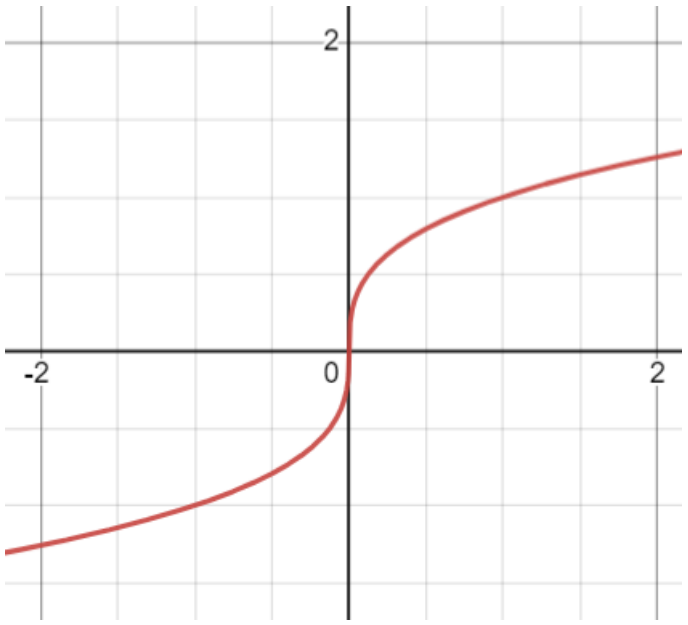
2) Cubic Functions



Parent Equation: $y = x^3$

Remember the HORIZONTAL change in direction at the origin for this graph!

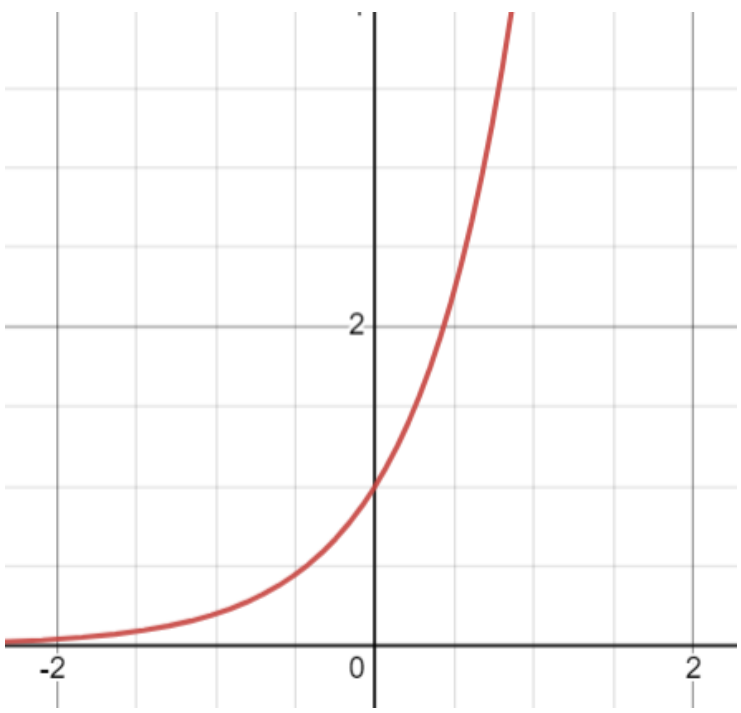
3) Cube Root Functions



Parent Equation: $y = \sqrt[3]{x}$

Remember the elongated S for this graph!

4) Exponential Functions



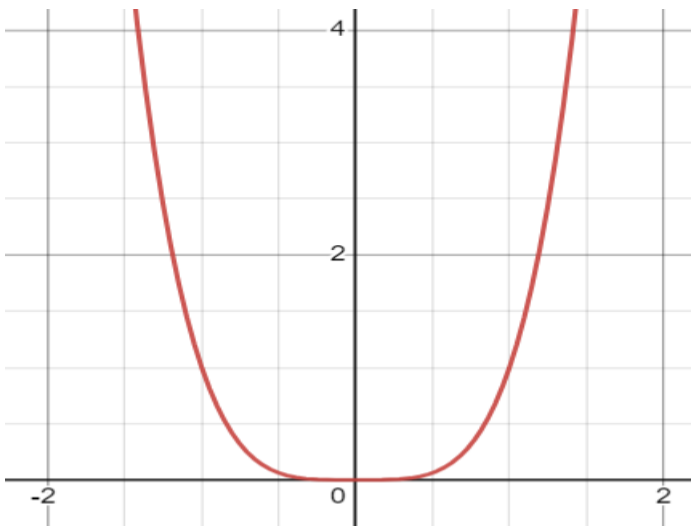
Parent Equation: $y = b(a^x)$

Remember half of a smiley face for this graph!

5) Higher Exponent Power Functions

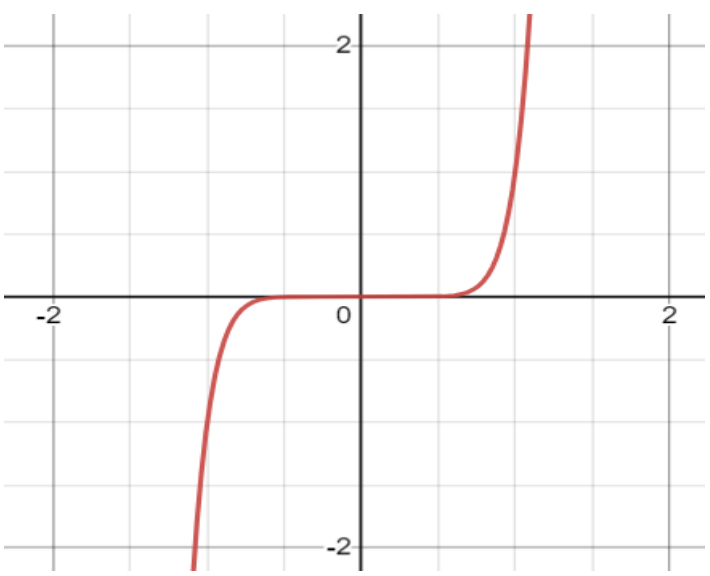
No matter what power x is raised to (whether it is the 3rd, 4th, 26th, 400th etc.), its graph will have one of 2 shapes.

If x's POWER is EVEN:



$y = x^4$

If x's POWER is ODD:



$y = x^9$

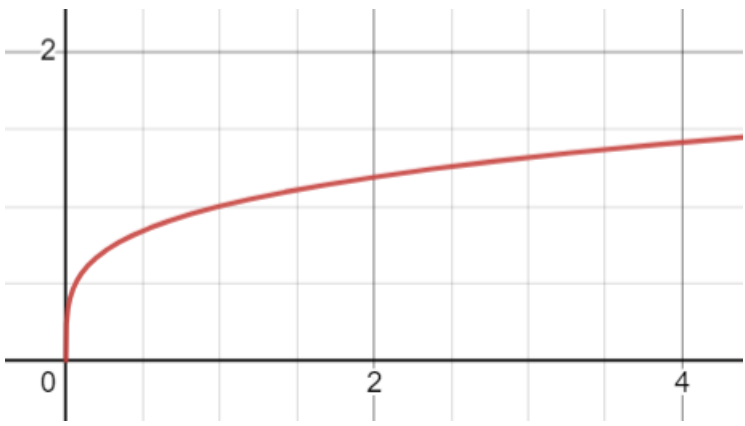
Remember 2 arms UP for all EVEN powered functions!

Remember 1 arm UP and 1 arm DOWN with a HORIZONTAL change in direction at the origin for all ODD powered functions!

6) Higher Exponent Root Functions

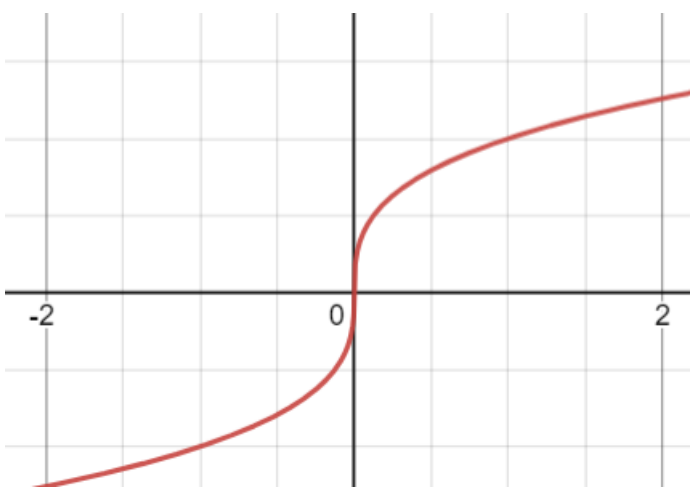
No matter what the index is of the root of x, its graph will have one of 2 shapes depending on whether the index is odd or even.

If the INDEX on the root is EVEN:



$$y = \sqrt[4]{x}$$

If the INDEX on the root is ODD:

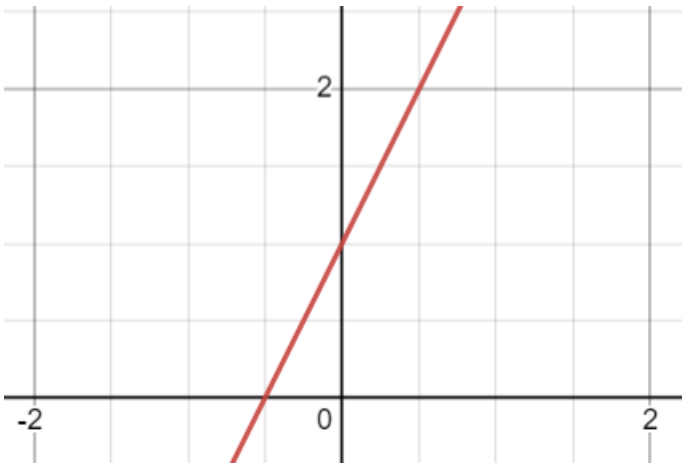


$$y = \sqrt[3]{x}$$

Remember the TOP portion of the letter S (since you cannot take the even root of a negative number) for any EVEN numbered index!

Remember the letter S for any ODD numbered index!

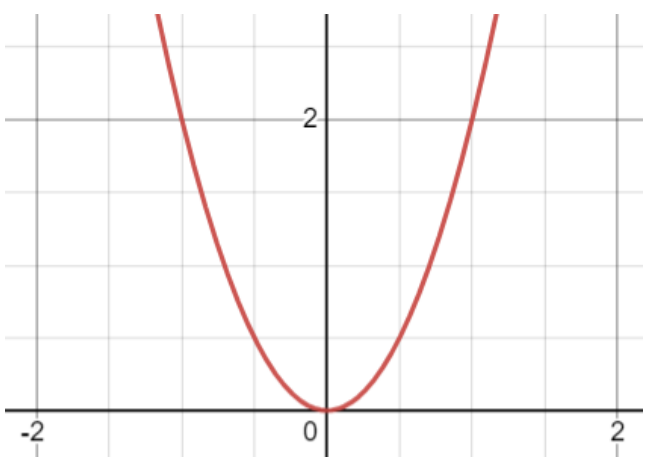
7) Linear Functions



Parent Equation: $y = mx + b$

Remember the word LINE in Linear for this graph!

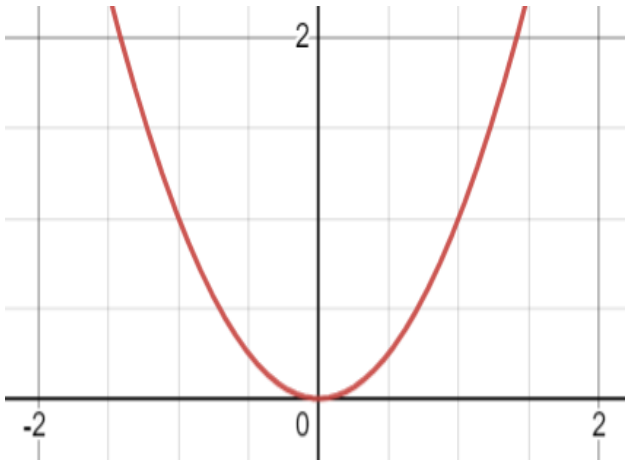
8) Quadratic Functions



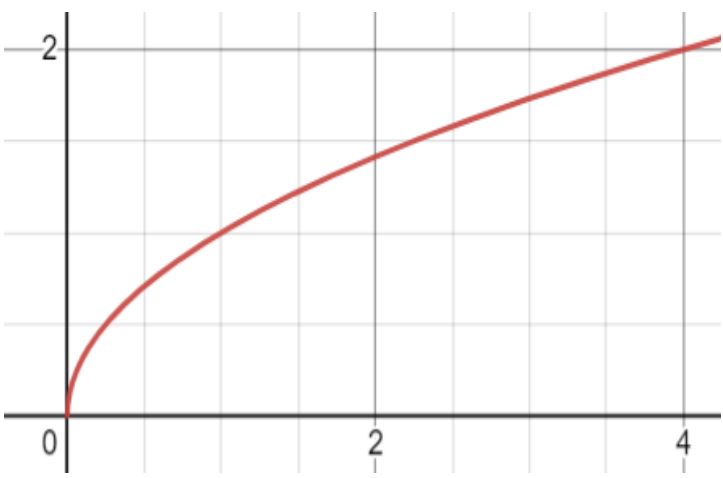
Parent Equation: $y = x^2$

Remember the SMILING U (when the x^2 term is positive) or the SAD U (when the x^2 term is negative) for this graph!

9 and 10) Square and Square Root Functions



$y = x^2$



$y = \sqrt{x}$

Remember the U and top portion of S, respectively for these graphs!

Tips for Solving Problems:

1. It is very important that you know these FUNCTIONS, their GRAPHS and their PARENT EQUATIONS! You are going to be using these functions more in depth later in Algebra 1, so make sure you know the functions in this lesson!

2. Remember that there is 1 general graph for EVEN-powered functions and there is 1 general graph for ODD-powered functions! It does not matter how big the power is because its graph will be one of those 2 shapes.

3. Remember that the graph of EVEN-indexed roots is the TOP part of the graph of ODD-indexed roots! It does not matter how big the index is because its graph will be one of those 2 shapes.