

Function

Function- pairs each element of the domain with one and only one element of the range.

Function Notation- most often, functions are portrayed as a set of x/y coordinates, with the vertical y-axis serving as a function of x, for example $y = f(x)$

Linear Function- is any function that graphs to a straight line

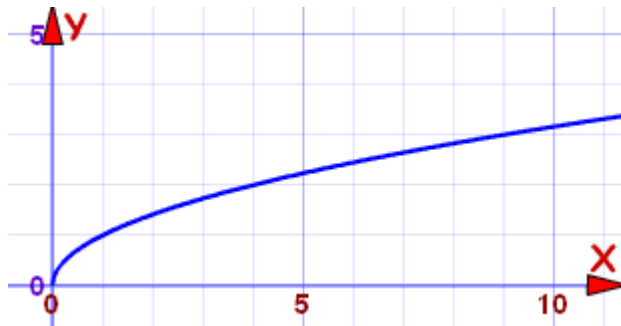
Quadratic Function- is a second-degree polynomial function of the form, where a, b, and c are real numbers. Every quadratic function has a “u-shaped” graph called a parabola.

Exponential Function- A function that contains a variable as an exponent

Square Root Function-

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

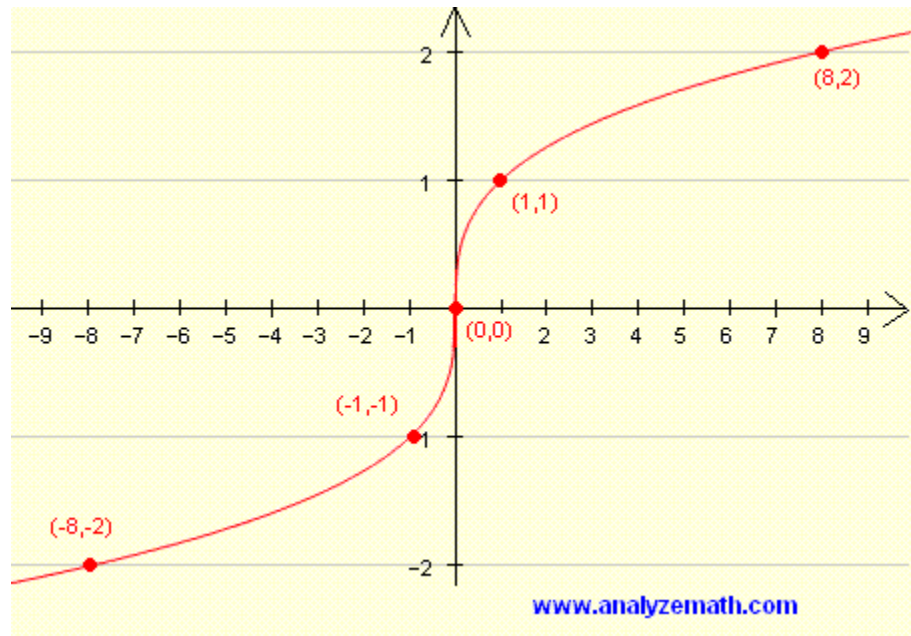
This is its graph:



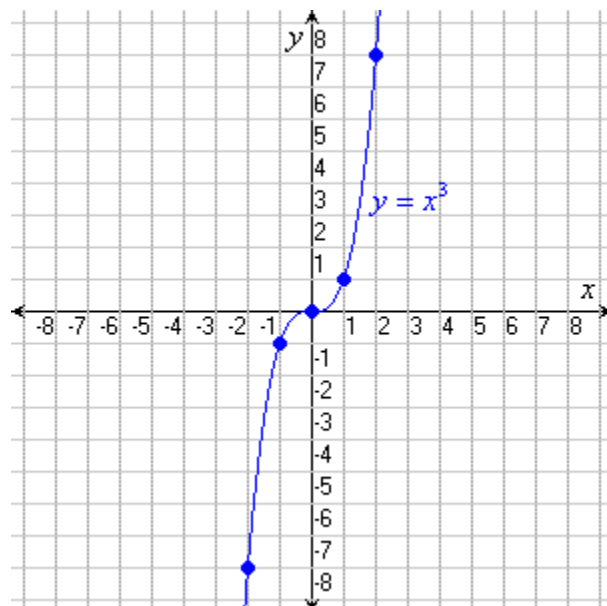
$$f(x) = \sqrt{x}$$

Domain and range are the Non-Negative Real Numbers: $[0, +\infty)$

Cube Root Function- $f(x) = \sqrt[3]{x}$



Cubic Function- $y = x^3$

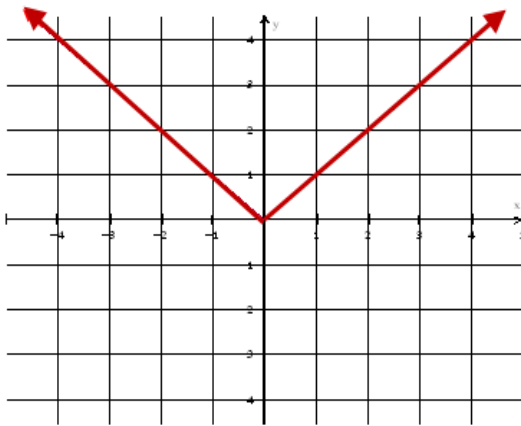


Absolute Value Function- $y = |x|$

Example 1: Graph

$$y = |x|$$

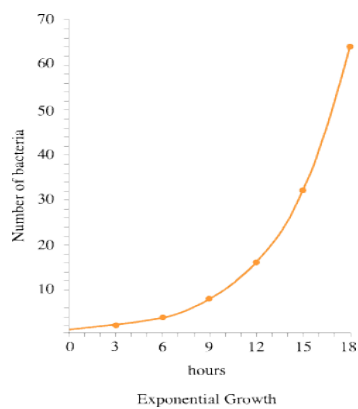
| x | y |
|----|---|
| 2 | 2 |
| 1 | 1 |
| 0 | 0 |
| -1 | 1 |
| -2 | 2 |



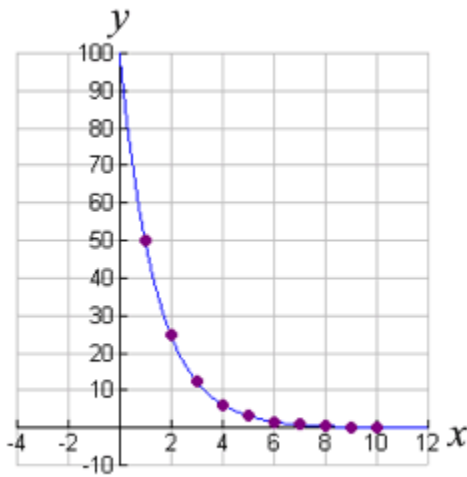
Parent Function- The most basic function in a family of functions.

Piecewise Function- A function that is defined by different expressions on different parts of the domain

Exponential Growth- The graph of an exponential function with a base greater than 1.



Exponential Decay- A decreasing exponential function. The base is smaller than one



Compound Interest-

Where interest is calculated on both the amount borrowed and any previous interest. Usually calculated one or more times per year.

So you work out the interest for the first period, add it to the total, and then calculate the interest for the next period, and so on, like this:



Elimination Method- The process of adding or subtracting one equation to another in order to eliminate one or more variables and solve a system of equations.

Substitution Method- Replacing a variable in one equation with an expression, equal to that variable, obtained from another equation to solve for a system of equations.

Point of Intersection- Where lines cross over (have some common point).

Domain/Input- is all the values that go into a function

Range/Output- all the values that come out

Sequence- a list of things (usually numbers) that are in order.

Recursive Sequence- Applying a rule or formula to its results (again and again).

Arithmetic Sequence- which has a constant difference between terms. The first term is a_1 , the common difference is d , and the number of terms is n .

$$\text{Explicit Formula} \quad a_n = a_1 + (n - 1)d$$

Geometric Sequence-

To find any term of a geometric sequence:

$$a_n = a_1 \cdot r^{n-1}$$

where a_1 is the first term of the sequence,
 r is the common ratio, n is the number of the term to find.

X-intercept- the point at which the graph of a function crosses the x-axis. The value of y is zero.

Y-intercept- the point at which the graph of a function crosses the y -axis. The value of x is zero.

Maximum- when the vertex is the highest point on the graph

Minimum- when the vertex is the lowest point on the graph

Vertex/Turning Point- The vertex of a parabola is the highest or lowest point

Axis of Symmetry-

A line through a shape so that each side is a mirror image.

When the shape is folded in half along the axis of symmetry, then the two halves match up.

Average Rate of Change-

$$A(x) = \frac{f(b) - f(a)}{b - a}$$

Slope-

$$m = \frac{\text{Change in Y}}{\text{Change in X}}$$

Horizontal Translation- A shift in which a plane figure moves left or right.

Vertical Shrinking- the graph becomes narrower

Vertical Stretching- the graph becomes wider

Vertical Translation- the plane figure moves up or down