

Intermediate Algebra
Parent Functions

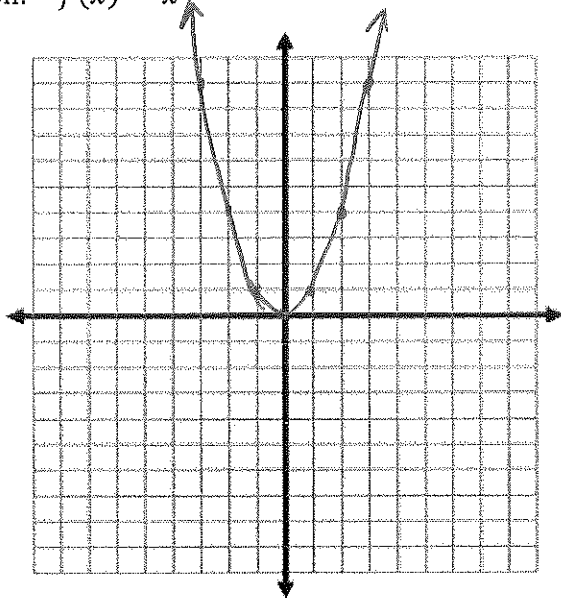
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Parent Function – The most basic form of a function in a family of functions. There is no vertical or horizontal shifts, no reflections, and no stretching.

In this unit we are going to study the following functions: Quadratic, Cubic, Absolute Value, Square Root, Cube Root, and Piecewise.

Quadratic Function: $f(x) = x^2$

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



Key Characteristics:

x-intercept(s): $(0,0)$

y-intercept(s): $(0,0)$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Relative Max: none

Relative Min: $(0,0)$

Absolute Max:

Absolute Min:

Interval(s) of increasing: $(0, \infty)$

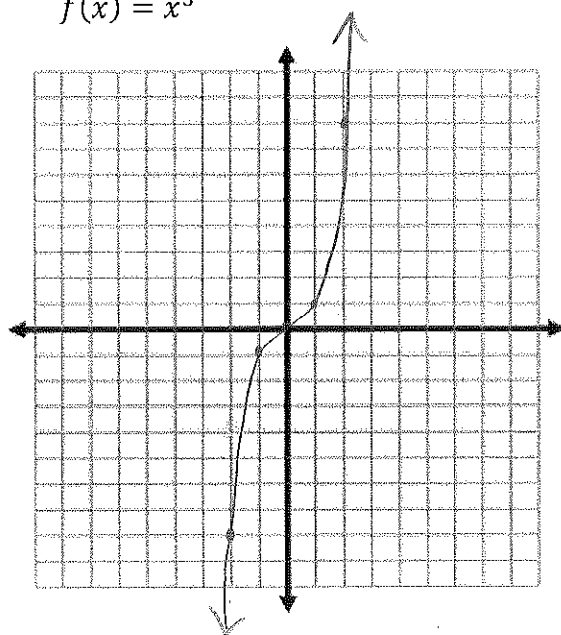
Interval(s) of decreasing: $(-\infty, 0)$

End behavior: $X \rightarrow -\infty \quad y \rightarrow \infty$
 $X \rightarrow \infty \quad y \rightarrow \infty$

Line of Symmetry: $x=0$

Cubic Function: $f(x) = x^3$

x	y
-3	-27
-2	-8
-1	-1
0	0
1	1
2	8
3	27



Key Characteristics:

x-intercept(s): $(0,0)$

y-intercept(s): $(0,0)$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Relative Max: none

Relative Min: none

Absolute Max:

Absolute Min:

Interval(s) of increasing: $(-\infty, \infty)$

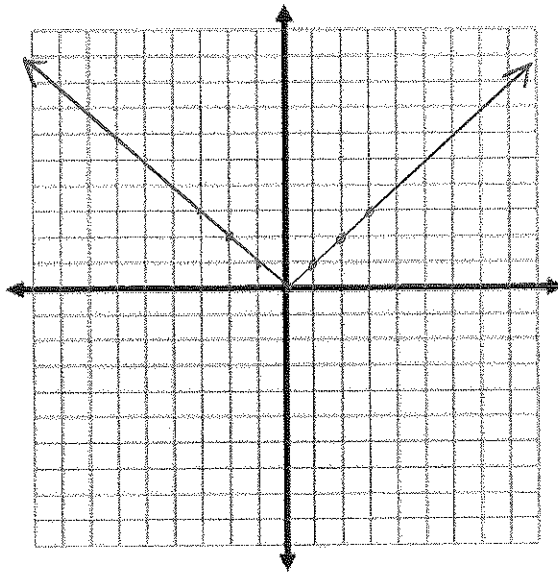
Interval(s) of decreasing: none

End behavior: $X \rightarrow -\infty \quad y \rightarrow -\infty$
 $X \rightarrow \infty \quad y \rightarrow \infty$

Line of Symmetry: none

Absolute Value Function: $f(x) = |x|$

x	y
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3



Key Characteristics:

x-intercept(s): $(0,0)$

y-intercepts: $(0,0)$

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Relative Max: none

Relative Min: $(0,0)$

Absolute Max:

Absolute Min:

Interval(s) of increasing: $(0, \infty)$

Interval(s) of decreasing: $(-\infty, 0)$

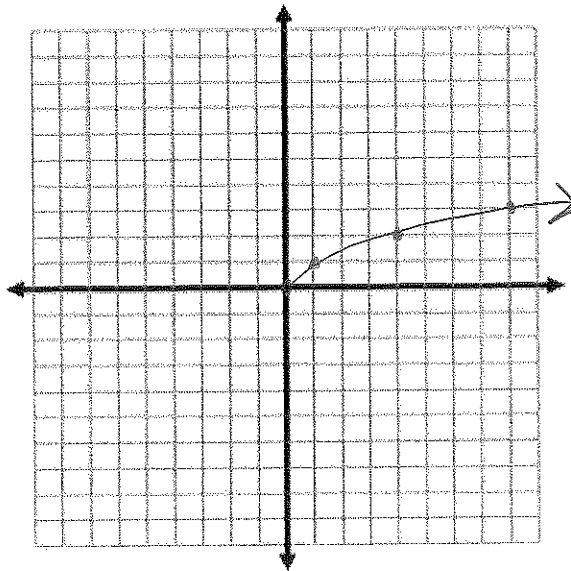
End behavior: $x \rightarrow -\infty$ $y \rightarrow \infty$

$x \rightarrow \infty$ $y \rightarrow \infty$

Line of Symmetry: $x=0$

Square Root Function: $f(x) = \sqrt{x}$

x	y
0	0
1	1
4	2
9	3
16	4
25	5
36	6



Key Characteristics:

x-intercept(s): $(0,0)$

y-intercepts: $(0,0)$

Domain: $[0, \infty)$

Range: $[0, \infty)$

Relative Max:

Relative Min: $(0,0)$

Absolute Max:

Absolute Min:

Interval(s) of increasing: $(0, \infty)$

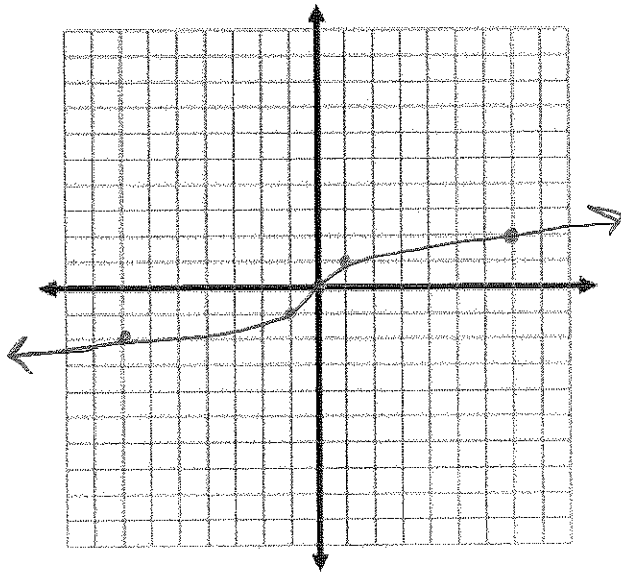
Interval(s) of decreasing: none

End behavior: $x \rightarrow \infty$ $y \rightarrow \infty$

Line of Symmetry: none

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

x	y
-27	-3
-8	-2
-1	-1
0	0
1	1
8	2
27	3



Key Characteristics:

x-intercept(s): $(0, 0)$

y-intercept(s): $(0, 0)$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Relative Max: none

Relative Min: none

Absolute Max:

Absolute Min:

Interval(s) of increasing: $(-\infty, \infty)$

Interval(s) of decreasing: none

End behavior: $x \rightarrow -\infty$ $y \rightarrow -\infty$

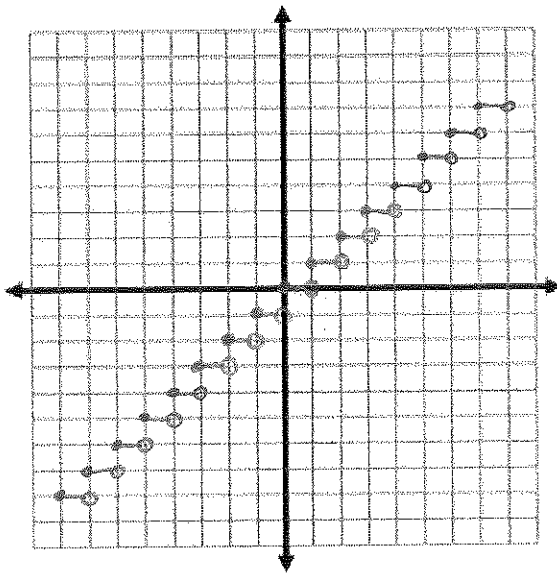
$x \rightarrow \infty$ $y \rightarrow \infty$

Line of Symmetry: none

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Step or Greatest Integer Function: $f(x) = \lceil x \rceil$

x	y
-3	-3
-2	-2
-1	-1
0	0
1	1
2	2
3	3



$y = \lceil x \rceil$

Key Characteristics:

x-intercept(s): $(0, 0)$

y-intercept(s): $(0, 0)$

Domain: All integer values

Range: All integer values

Relative Max: none

Relative Min: none

Absolute Max:

Absolute Min:

Interval(s) of increasing:

Interval(s) of decreasing:

End behavior:

Line of Symmetry: