Parent ~~Adding and Subtracting~~ Functions

7.~~2~~ 1

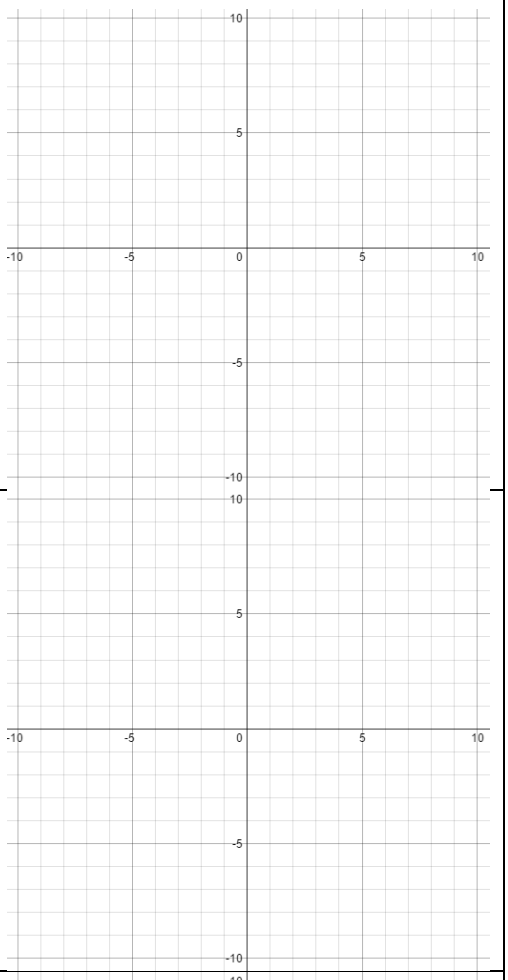
Parent Functions

Secondary Math II Notes

Parent function: A parent function is the simplest function of a family of functions. For example the simplest function for a quadratic is $f(x) = x^2$

Even function: A function is even if it is symmetrical about the y-axis. Algebraically it is defined as $f(-x) = f(x)$

Odd functions: A function is odd if it is symmetrical about the origin. Algebraically it is defined as $f(-x) = -f(x)$

Parent Function	Graph
$f(x) = x$ **Linear** Characteristics: Domain $(-\infty, \infty)$ Range $(-\infty, \infty)$ End Behavior $x \to -\infty, y \to -\infty$ $x \to \infty, y \to \infty$ Even or Odd Function: It is symmetrical about the origin. Therefore it is odd.	x: -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 f(x): -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 
$f(x) = b^x, b > 1$ $f(x) = 2^x$ *represents the graph* **Exponential** Characteristics: Domain $(-\infty, \infty)$ Range $(0, \infty)$ End Behavior $x \to -\infty, y \to 0$ $x \to \infty, y \to \infty$ Even or Odd Function: It is neither an odd function nor an even function because there is no symmetry.	x: -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 f(x): .031, .063, 0.13, 0.25, 0.5, 1, 2, 4, 8, 16, 32
$f(x) = x^2$ **Quadratic—graph is called parabola** Characteristics: Domain $(-\infty, \infty)$ Range $[0, \infty)$ End Behavior $x \to -\infty, y \to \infty$ $x \to \infty, y \to \infty$ Even or Odd Function: It is symmetrical about the y-axis. Therefore it is Even.	x: -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 f(x): 25, 16, 9, 4, 1, 0, 1, 4, 9, 16, 25

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

Radical (square root)

Characteristics:

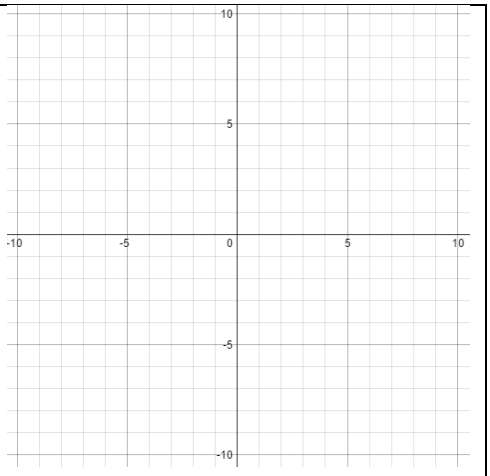
Domain $[0, \infty)$

Range $[0, \infty)$

End Behavior $x \to \infty, y \to \infty$

Even or Odd Function: It is not symmetrical since the domain is restricted. Therefore it is neither.

x	f(x)
0	0
.2	.45
0.4	.63
0.6	.77
0.8	.89
1	1
2	1.41
3	1.73
4	2
9	3
16	4
25	5
36	6



$f(x) = |x|$

Absolute value

Characteristics:

Domain $(-\infty, \infty)$

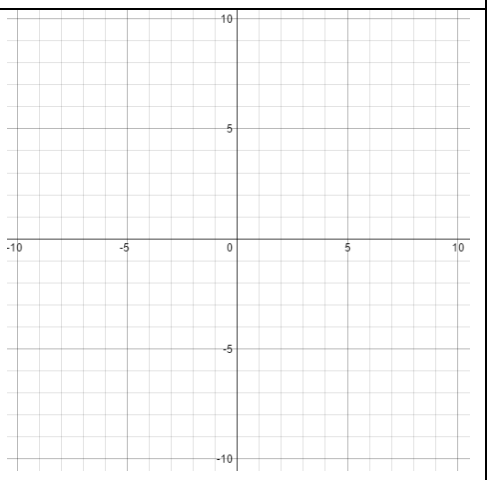
Range $[0, \infty)$

End Behavior $x \to -\infty, y \to \infty$

$x \to \infty, y \to \infty$

Even or Odd Function: It is symmetrical about the y-axis. Therefore it is even.

x	f(x)
-5	5
-4	4
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3
4	4
5	5



$f(x) = x^3$

Cubic

Characteristics:

Domain $(-\infty, \infty)$

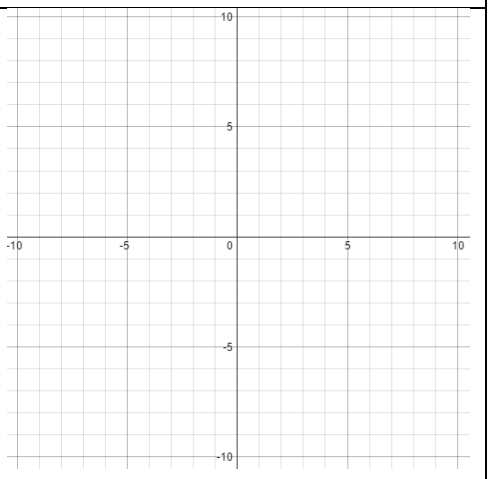
Range $(-\infty, \infty)$

End Behavior $x \to -\infty, y \to -\infty$

$x \to \infty, y \to \infty$

Even or Odd Function: It is symmetrical about the origin. Therefore it is odd.

x	f(x)
-5	125
-4	-64
-3	-27
-2	-8
-1	-1
0	0
1	1
2	8
3	27
4	64
5	125



$f(x) = C$

f(x)=2 represents the graph

Constant

Characteristics:

Domain $(-\infty, \infty)$

Range $[0, \infty)$

End Behavior $x \to -\infty, y \to C$

$x \to \infty, y \to C$

Even or Odd Function: It is symmetrical about the y-axis. Therefore it is even.

x	f(x)
-5	2
-4	2
-3	2
-2	2
-1	2
0	2
1	2
2	2
3	2
4	2
5	2