lulumath

Parent Functions Part I (Linear, Quadratic, Square Root)

Video Notes

Video Link

Parent Functions Part I
(Linear, Quadratic, Square Root)

Background Knowledge:

- What is a function?
- Domain and Range

What is a parent function?

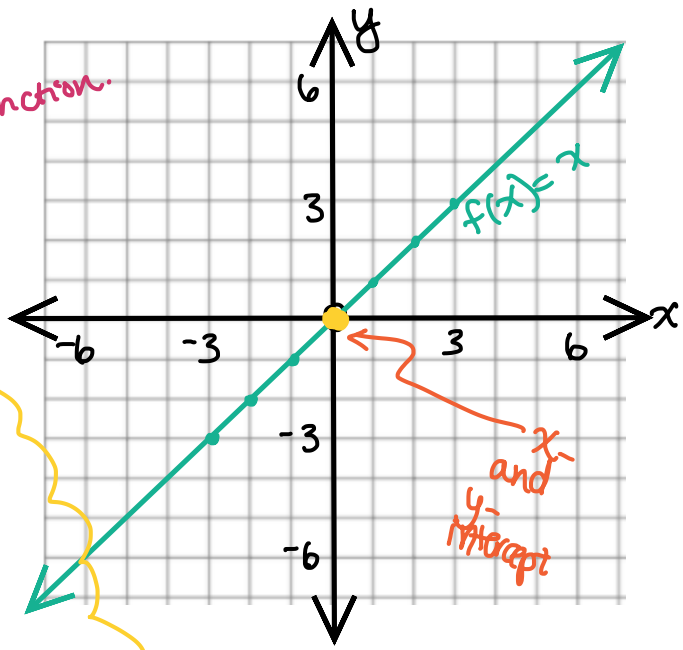
In a family of functions, a parent function is the most basic function that keeps that family's characteristics.

Parent Function #1: LINEAR

Parent Function: $y = x$ → The most basic function.

$f(x) = x$

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



Key Features:

- x-intercept: (0,0)
- y-intercept: (0,0)
- Domain: $\{x \in \mathbb{R}\}$ OR $(-\infty, \infty)$
- Range: $\{y \in \mathbb{R}\}$ OR $(-\infty, \infty)$

This is true for all linear functions except vertical and horizontal lines.

P.S. Not even a function!

Parent Function #2: QUADRATIC

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

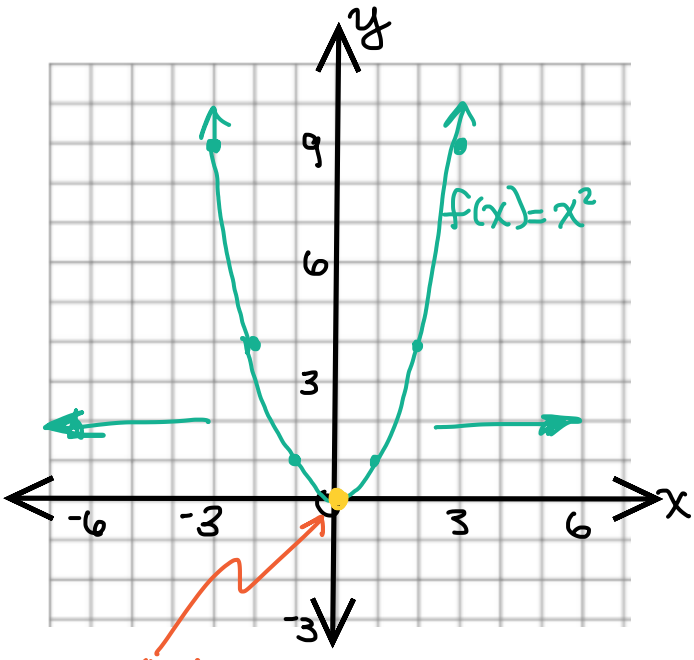
x	f(x)
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9

Key Features:

- vertex: (0,0)
- x-intercept: (0,0)
- y-intercept: (0,0)
- Domain: $\{x \in \mathbb{R}\}$ OR $(-\infty, \infty)$
- Range: $\{y \in \mathbb{R} \mid y \geq 0\}$ OR $[0, \infty)$

True for all quadratic functions.

Depends on the vertex



Vertex, x-intercept and y-intercept

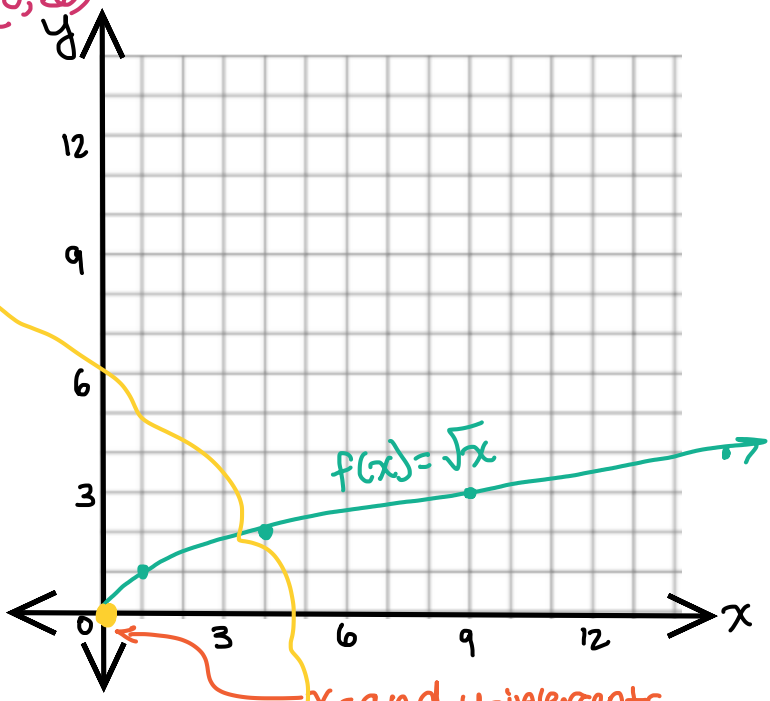
Parent Function #3: SQUARE-ROOT

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

x	f(x)
0	0
1	1
~~2~~	~~1.414~~
4	2
9	3
16	4

Key Features:

- x-intercept (0,0)
- y-intercept (0,0)
- Domain: Can only take the square root of non-negatives. $\{x \in \mathbb{R} \mid x \geq 0\}$ OR $[0, \infty)$
- Range: $\{y \in \mathbb{R} \mid y \geq 0\}$ OR $[0, \infty)$



x- and y-intercepts