



# Parent Functions Part II (Absolute Value, Reciprocal, Exponential)

Video Notes

[Video Link](#)

# Parent Functions Part II

## (Absolute Value, Reciprocal, Exponential)

Background Knowledge:

- Parent Functions Part I
- 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 #4: ABSOLUTE VALUE

Parent Function:  $f(x) = |x|$

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

Key Features:

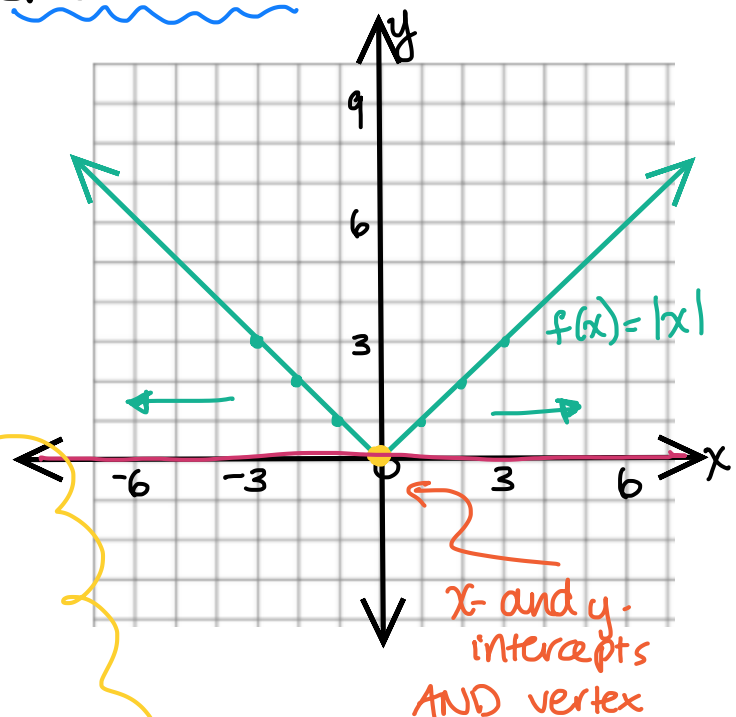
x-intercept:  
 $(0,0)$

y-intercept:  
 $(0,0)$

vertex:  
 $(0,0)$

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

Range:  
 $\{y \in \mathbb{R} \mid y \geq 0\}$  OR  $[0, \infty)$



True for the entire family of absolute value functions.

Depends on transformations

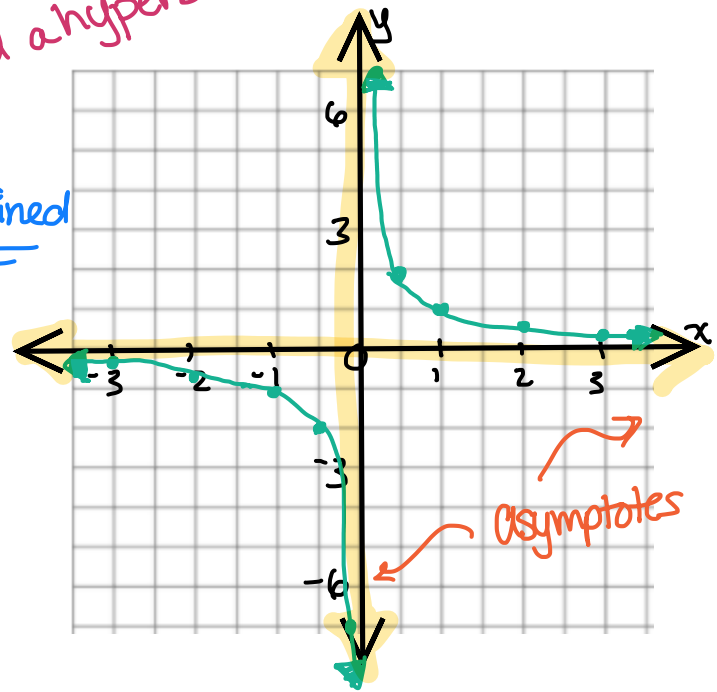
Parent Function #5: RECIPROCAL

Parent Function:  $f(x) = \frac{1}{x}$  ← called a hyperbola  
 $f(0) = \frac{1}{0} = \text{undefined}$

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

Key Features:

- No x- or y-intercepts
- Domain:  $\{x \in \mathbb{R} \mid x \neq 0\}$  OR  $(-\infty, 0) \cup (0, \infty)$
- Range:  $\{y \in \mathbb{R} \mid y \neq 0\}$  OR  $(-\infty, 0) \cup (0, \infty)$



Parent Function #6: EXPONENTIAL\*

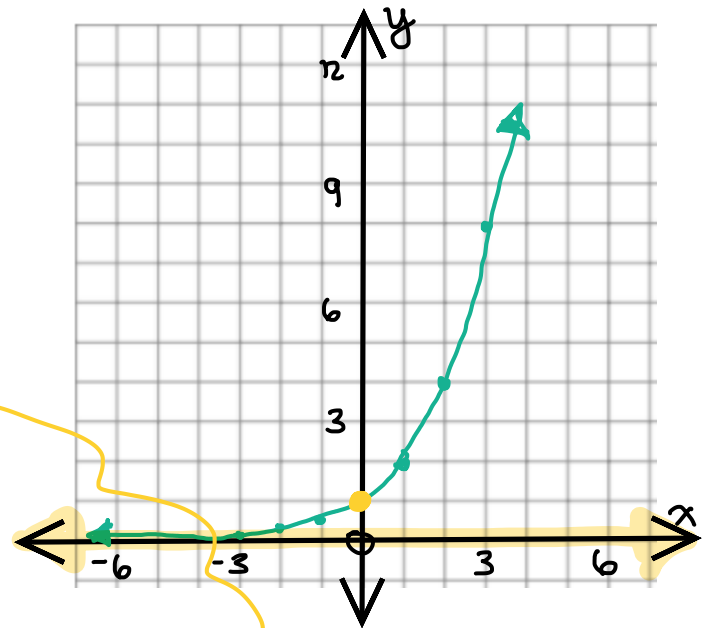
have multiple parent functions → depending on the base

Parent Function:  $f(x) = b^x$  ← any base  
 $f(x) = 2^x$

x	f(x)
-3	1/8
-2	1/4
-1	1/2
0	1
1	2
2	4
3	8

Key Features:

- No x-intercept (There is an asymptote @  $y=0$ )
- y-intercept:  $(0, 1)$
- Domain:  $\{x \in \mathbb{R}\}$  OR  $(-\infty, \infty)$
- Range:  $\{y \in \mathbb{R} \mid y > 0\}$  OR  $(0, \infty)$



True for  $f(x) = b^x$