What's Going On?

Checking In H.W. Logs

Minds on Finishing Function Notation

Action! Parent Functions

Consolidation Match 'em Up

Learning Goal - I will recognize the five parent functions and be able to identify similarities and differences between them.

What's happening at

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Minds on

Function Notation

Example 4: Given $h(x) = 5x + 3$, determine x when $h(x) = 7$.

$$7 = 5x + 3$$
$$\frac{4}{5} = \frac{5x}{5}$$
$$x = \frac{4}{5}$$

Minds on

Function Notation

Example 5: Consider $f(x) = x^2 + 5x$ and $g(x) = -3x + 2$. Determine:

a) $f(2b)$

$f(2b) = (2b)^2 + 5(2b)$

$f(2b) = 4b^2 + 10b$

b) $f(a + 3) - g(a + 3)$

$= [(a+3)^2 + 5(a+3)] - [-3(a+3) + 2]$

$= [(a+3)(a+3) + 5a + 15] - [-3a - 9 + 2]$

$= [a^2 + 3a + 3a + 9 + 5a + 15] - [-3a - 7]$

$= a^2 + 11a + 24 + 3a + 7$

$= a^2 + 14a + 31$

Action!

First, some new terms.

NEW TERM

A **family** is a collection of functions (or lines or curves) sharing common characteristics.

NEW TERM

A **parent function** is the simplest, or base, function in a family.

NEW TERM

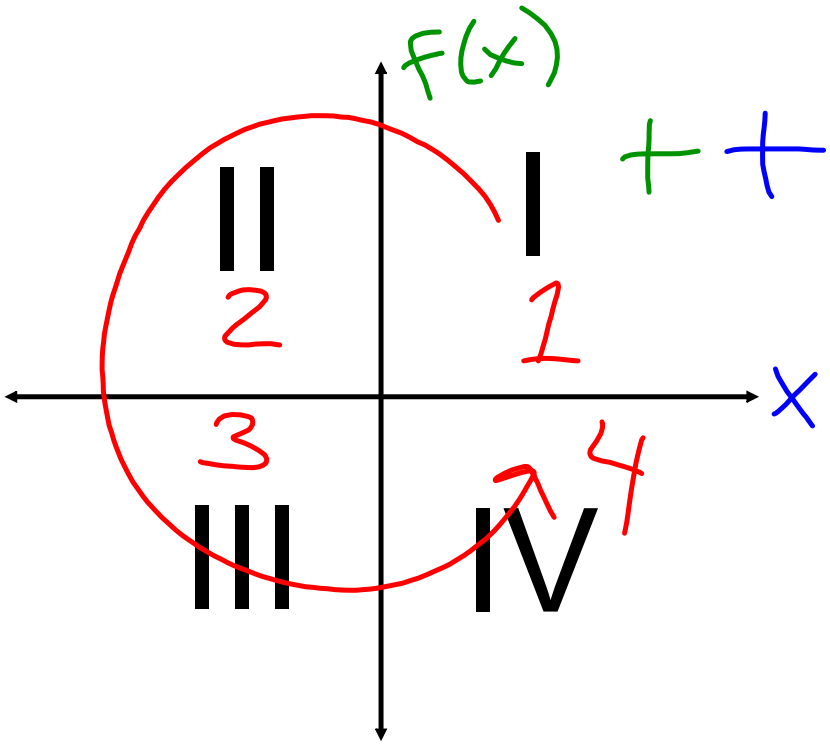
The **absolute value** of x, written as $|x|$, is the distance from x to zero.

NEW TERM

An **asymptote** is a line that the graph of a relation or function gets closer and closer to, but never meets, on some portion of its domain.

Action!

The 4 Quadrants of the x,y Plane



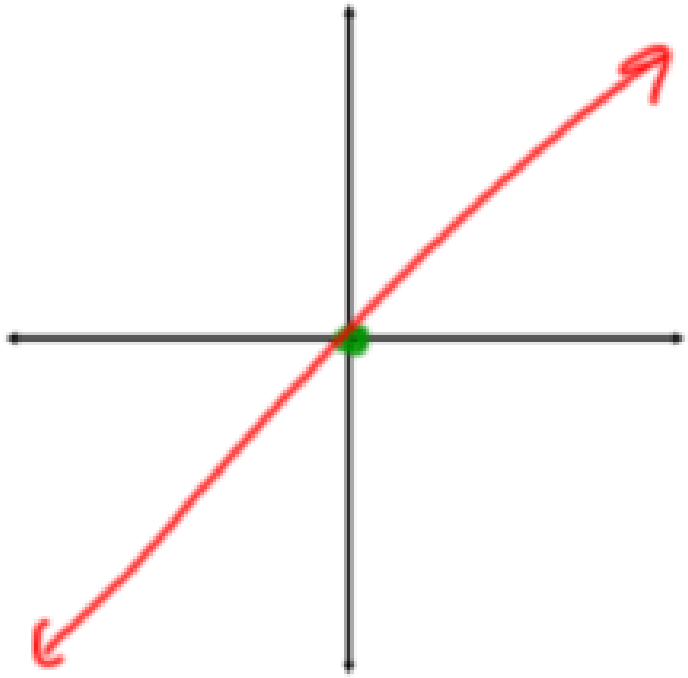
Action!

Parent Functions

A **parent function** is the simplest, or base, function in a family.

Linear Function

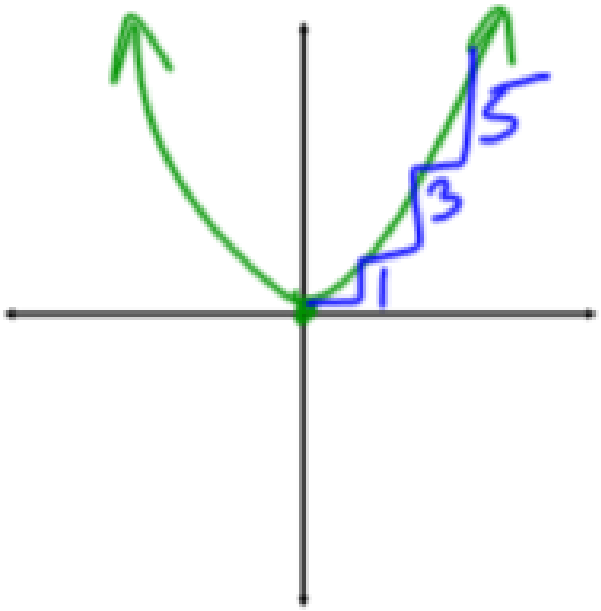
$$f(x) = x$$



- it's a line!
- goes through the origin
- slope of 1 (m)
- y-intercept of 0 (b)
- x-intercept of 0
- y=mx+b form is y = 1x + 0

Quadratic Function

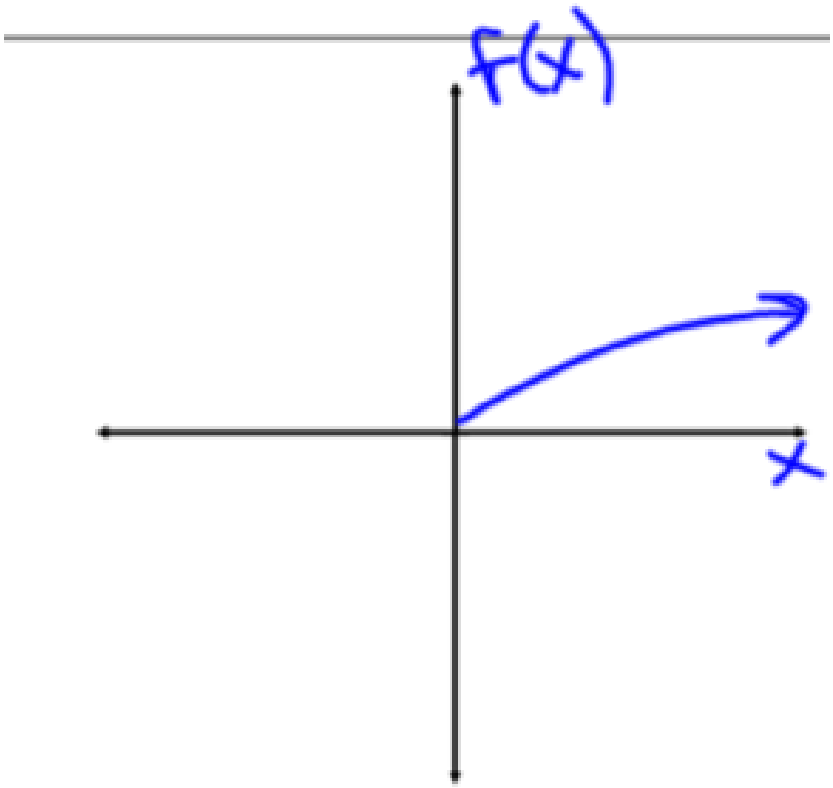
$$f(x) = x^2$$



- it's a parabola
- opens up
- vertex at (0, 0)
- step pattern is 1, 3, 5, 7, ...
- x and y-intercepts are both 0
- in vertex form y=a(x-h)^2+k
  a = 1, h = 0, k = 0
- the curve has not been stretched or compressed
- has a minimum but no maximum

Square Root Function

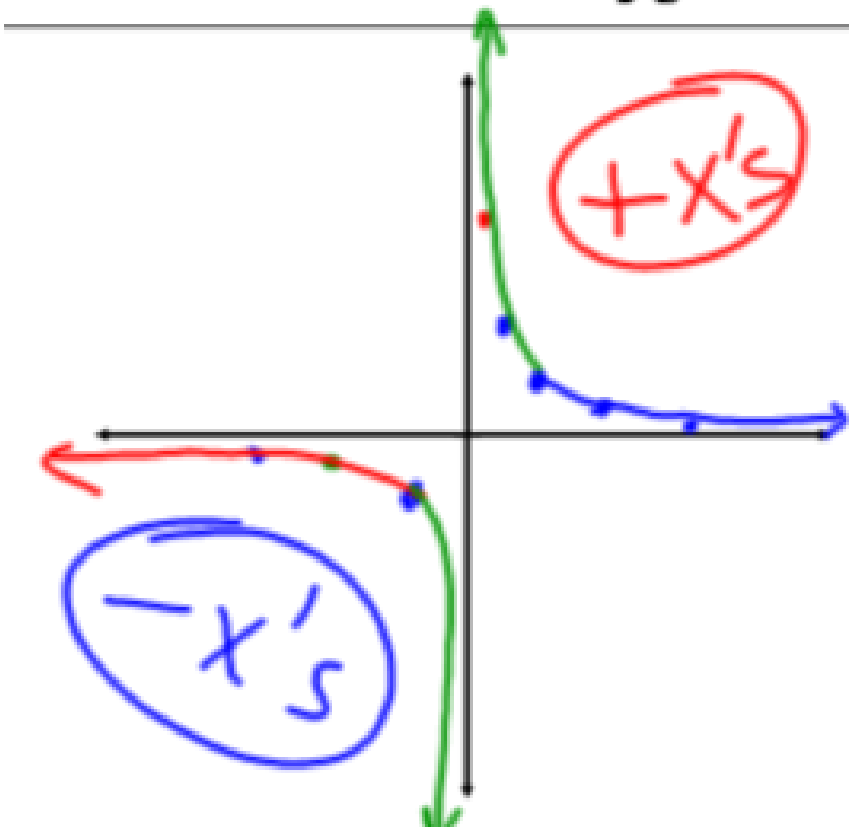
$$f(x) = \sqrt{x}$$



- y is always positive
- when x = 1, y = 1
- when 0 < x < 1, x < f(x)
- when x > 1, x > f(x)
- increasing from left to right
- growth slows down

Reciprocal Function

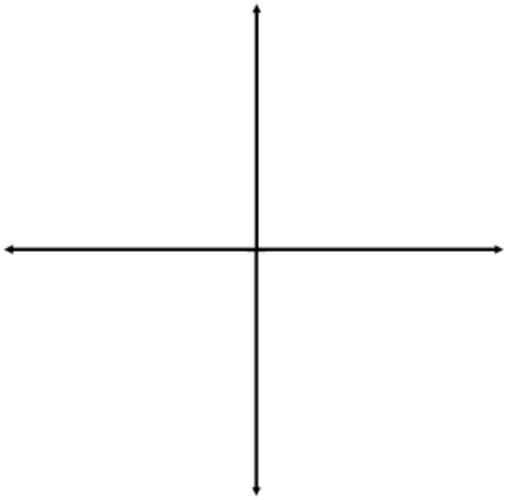
$$f(x) = \frac{1}{x}$$



- two asymptotes (the x-axis and the y-axis)
  - **x = 0** and **y = 0**
- When x is POSITIVE
  - as |x| increases, f(x) decreases (approaches zero)
  - as |x| decreases, f(x) increases (approaches infinity)
- When x is NEGATIVE
  - as |x| increases, f(x) decreases (approaches zero)
  - as |x| decreases, f(x) increases (approaches negative infinity)

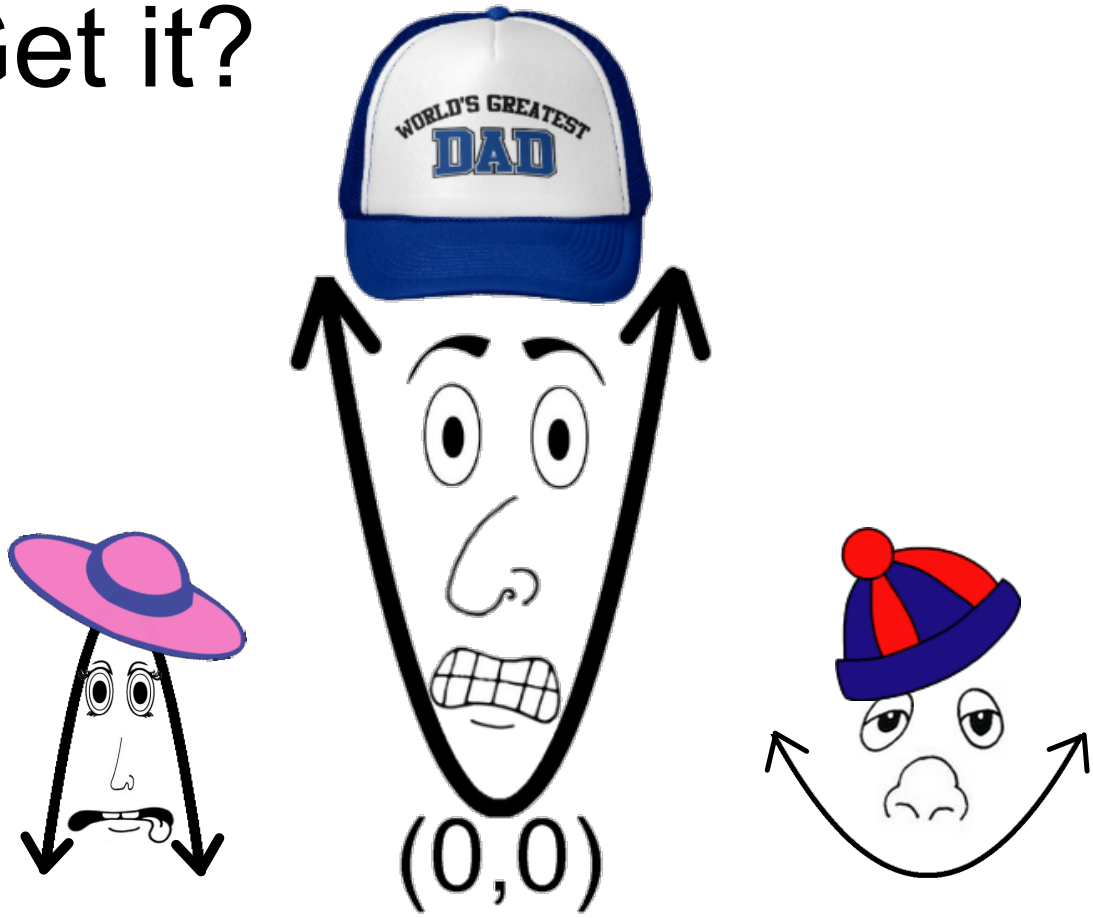
Absolute Value Function

$$f(x) = |x|$$



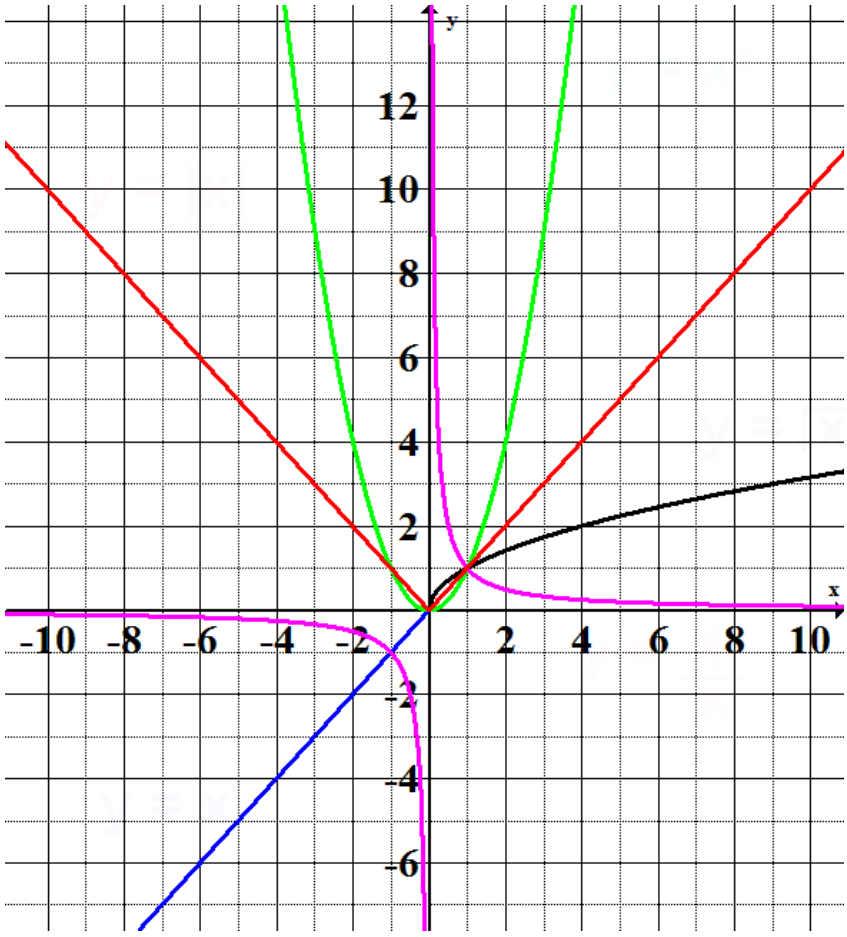
Consolidation

Get it?



Consolidation

Match 'em Up!



- $y = x$
- $y = x^2$
- $y = \sqrt{x}$
- $y = \frac{1}{x}$
- $y = |x|$

Consolidation

NEW TERMS

Family

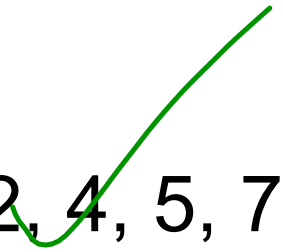
Parent Function

Absolute Value

Asymptote

Consolidation

Homework!



Pg. 22: 1, 2, 4, 5, 7, 8b, 9b, 11, 12

Pg. 28: 1 - 3

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