

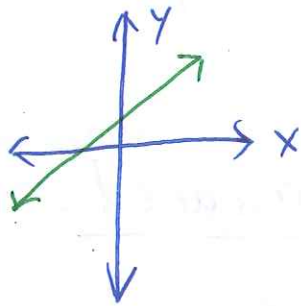
Name: Key

## Families of Functions: Notes from our graphs

We made up our own names for the graphs that we made in class, but mathematicians have special names that they use to refer to these families of functions.

1. Family Name: Linear

What the graph looks like:



a straight  
line

Some examples:

$$y = x - 47$$

$$y = 9x + 8.7$$

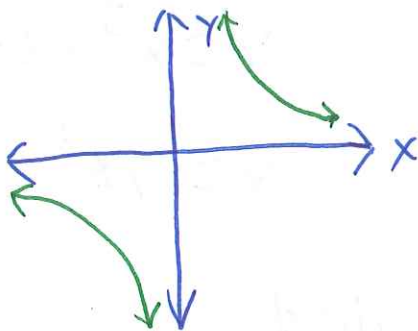
$$y = 10x$$

Special features:

just "x" in the equation

2. Family Name: Rational (Inversely Proportional)

What the graph looks like:



a hyperbola

Some examples:

$$y = \frac{14}{x}$$

$$y = \frac{9}{x}$$

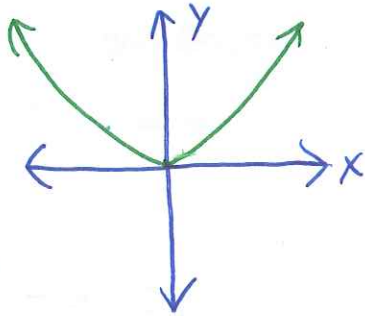
$$y = \frac{1}{x} + 10$$

Special features:

something is divided by x.

3. Family Name: Quadratic

What the graph looks like:



a parabola

Some examples:

$$y = x^2 + 2$$

$$y = x^2 + 7x - 11$$

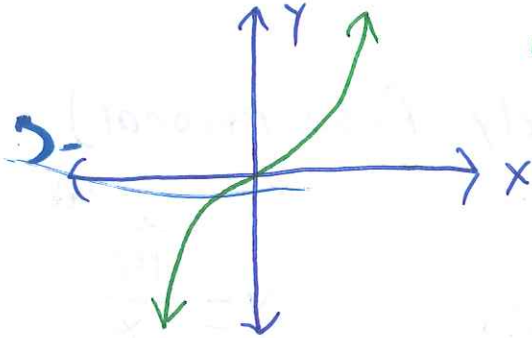
$$y = 3x^2$$

Special features:

The  $x$  term is squared.

4. Family Name: Cubic

What the graph looks like:



"slides through"

Some examples:

$$y = x^3 + 9$$

$$y = x^3 - 21$$

$$y = x^3 + 2x^2 + x + 1$$

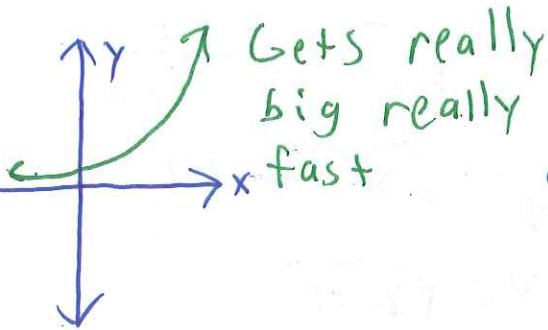
$$y = 7x^3$$

Special features:

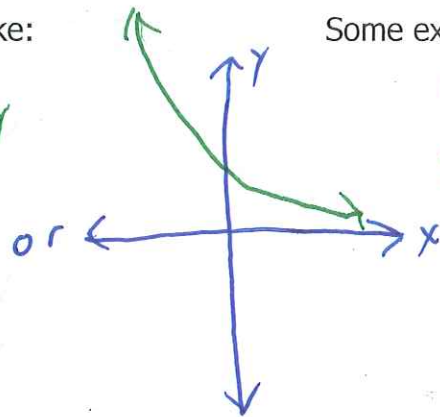
The  $x$  term is cubed.

5. Family Name: Exponential

What the graph looks like:



Some examples:



Gets really small really fast

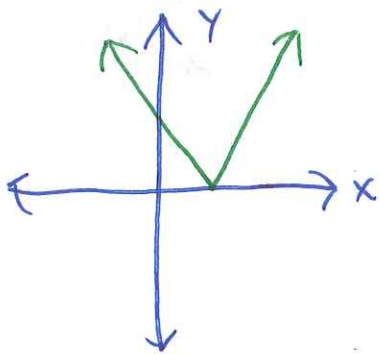
$$y = 10^x$$
$$y = \left(\frac{1}{4}\right)^x$$

Special features:

Something in the equation is raised to the power of  $x$ .  
or The  $x$  is in the EXPONENT.

6. Family Name: Absolute Value

What the graph looks like:



"V-shaped"

Some examples:

$$y = 6|x|$$

$$y = |x + 8|$$

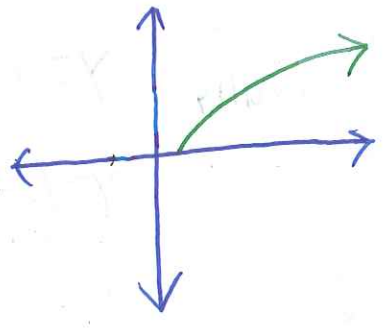
$$y = |x| - 48$$

Special features:

The  $x$  appears in the absolute value bars.

7. Family Name: Root

What the graph looks like:



Some examples:

$$y = \sqrt{x}$$

$$y = \sqrt{x} - 12$$

$$y = \sqrt{x+1}$$

Special features:

The x is under the radical.  
(square root symbol)