1-2 Transformations

Objectives:

- I can identify transformation from an equation and graph
- I can graph a transformed parent function

Domain changes
Range changes

$y = \pm a f(\pm b(x \pm h)) \pm k$

	Vertical outside	Horizontal inside
Shift add/sub	$f(x) \pm k$	$f(x \pm h)$
Stretch/Compress multiplication	$af(x)$	$\cancel{f(bx)}$
Reflection multiply by negative	$-f(x)$	$f(-x)$

Vertical:
if $a > 1$, stretch
if $a < 1$, compression

Horizontal:
if $b > 1$, compress
if $b < 1$, stretch

Information to remember about transformations....

x's lie

any change to the domain (x's) is opposite of what appears in the equation

$\sqrt{x}$

Ex. 1 State the transformations:

$f(x)=\sqrt{x}-2$

Shift down 2

$f(x)=\sqrt{x+3}$

~~H.~~ Shift Left 3

$f(x)=2\sqrt{x}$

V. Stretch by 2

$f(x)=\frac{1}{3}\sqrt{x}$

V. Compress by 1/3

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

Flip Vertically

(Reflect across x-axis)

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

Flip Horizontal

(Ref. across y-axis)

$f(x)=\sqrt{3x}$

H. Compression by 1/3

$f(x)=\sqrt{\frac{1}{8}x}$

H. Stretch by 8

State the parent function and identify the transformations and graph

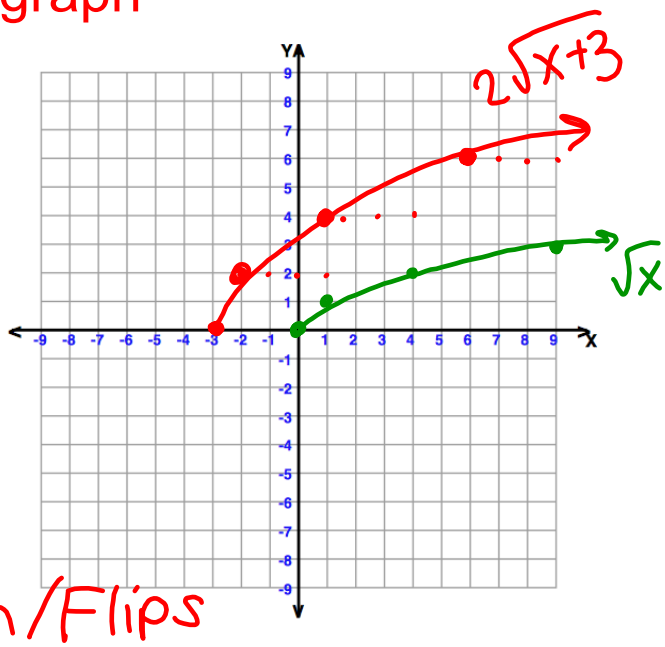
$$y = 2\sqrt{x+3}$$

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

V. Stretch by 2

Shift Left 3

* Always stretch/Flips



State the parent function and identify the transformations and graph

$$y = -(x-2)^2 + 1$$

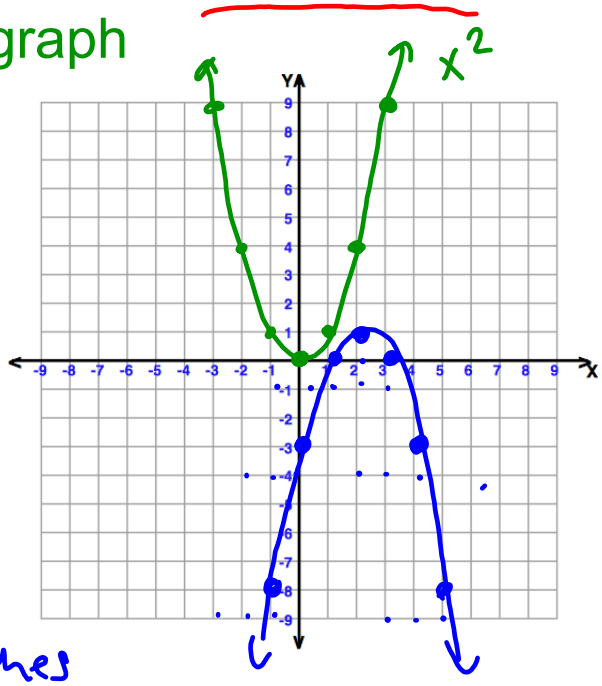
$f(x) = x^2$

V. Flip

Shift Right 2

Shift up 1

* Start w/ Flips/Stretches



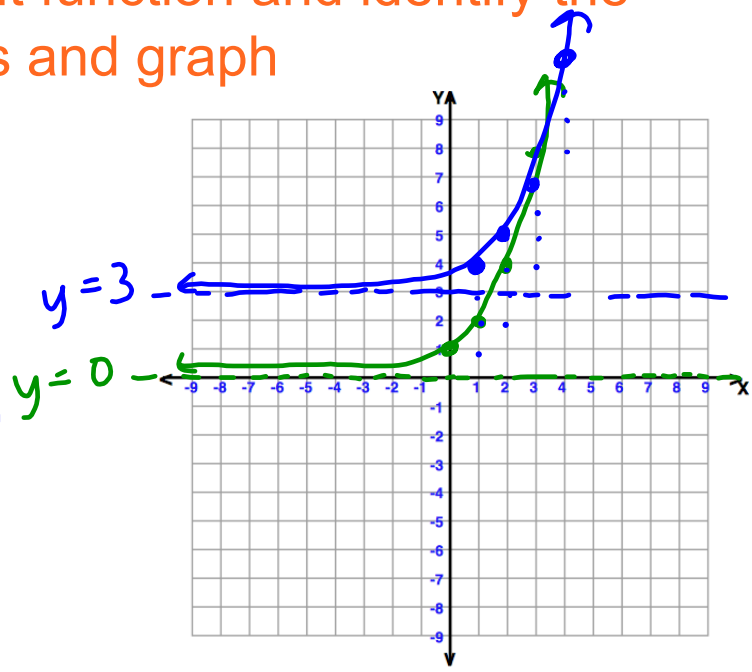
State the parent function and identify the transformations and graph

$$y = 2^{x-1} + 3$$

$f(x) = 2^x$

Shift Up 3

Shift Right 1



State the parent function and identify the transformations and graph

$$y = 3|x| + 2$$