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 (Multiply)	$af(x)$	----------
Reflection/Flip (Multiply by a negative)	$-f(x)$	$f(-x)$

Information to remember about transformations....

x's lie

Horizontal (inside)

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

$(x+3)^2$ → Shift Left 3

$(x-3)^2$ → Shift Right 3

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

Ex. 1 State the parent function and transformations:

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

Shift Down 2

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

Shift Left 3

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

V. Stretch by 2

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

V. Compression (Stretch) by 1/3

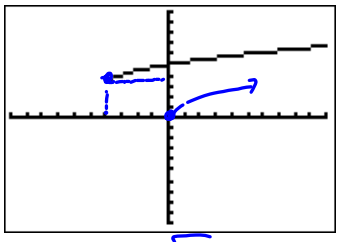
$f(x)=-\sqrt{x}$

V. Flip

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

H. Flip

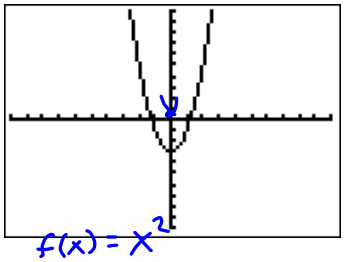
Identify the transformations from the following graphs



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

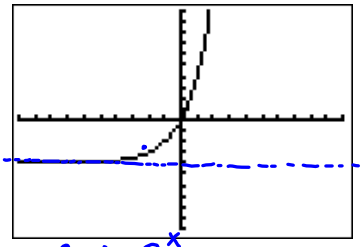
Shift Left 4

Shift Up 4



$f(x) = x^2$

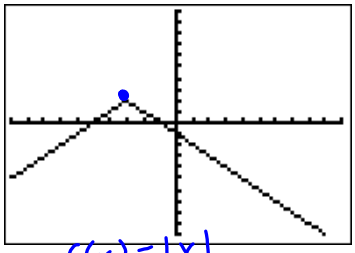
Shift down 3



$f(x) = 2^x$

Shifted Down 5

Shift Left?



$f(x) = |x|$

Shifted Up 2

Shifted Left 3

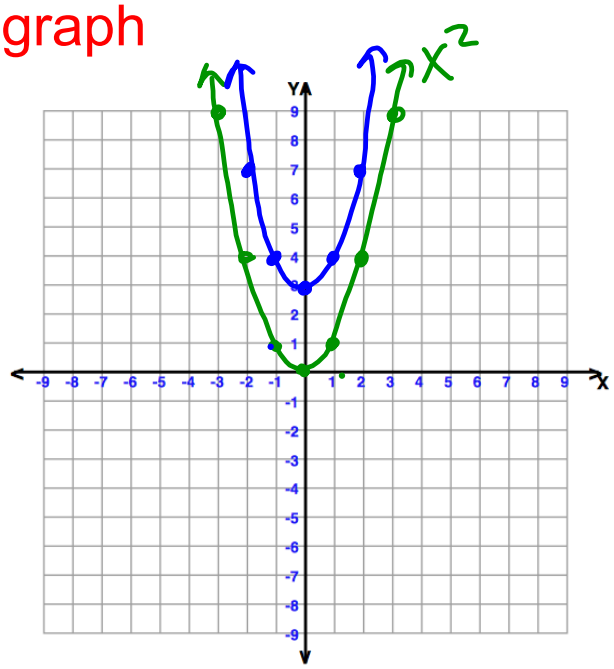
Flipped Vertically

State the parent function and identify the transformations and graph

$f(x) = x^2$

$y = x^2 + 3$

Shift Up 3



State the parent function and identify the transformations and graph

$f(x) = x^2$

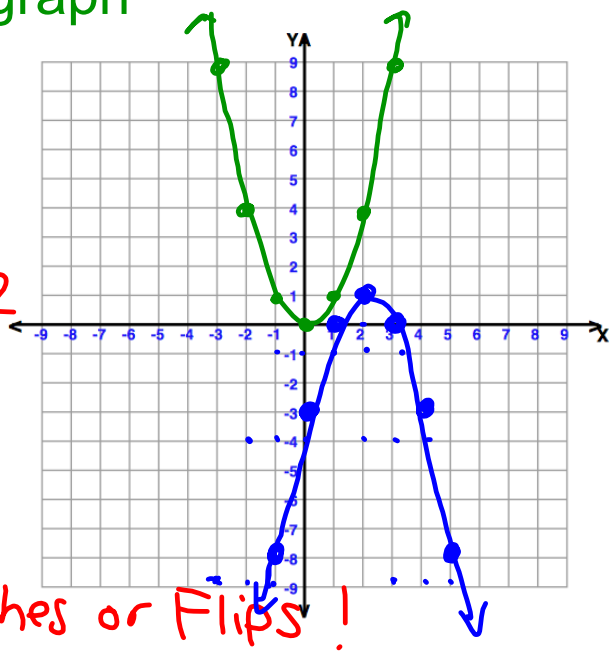
$y = -(x-2)^2 + 1$

V. Flip

H. Shift Right 2

V. Shift Up 1

★ Start with Stretches or Flips !



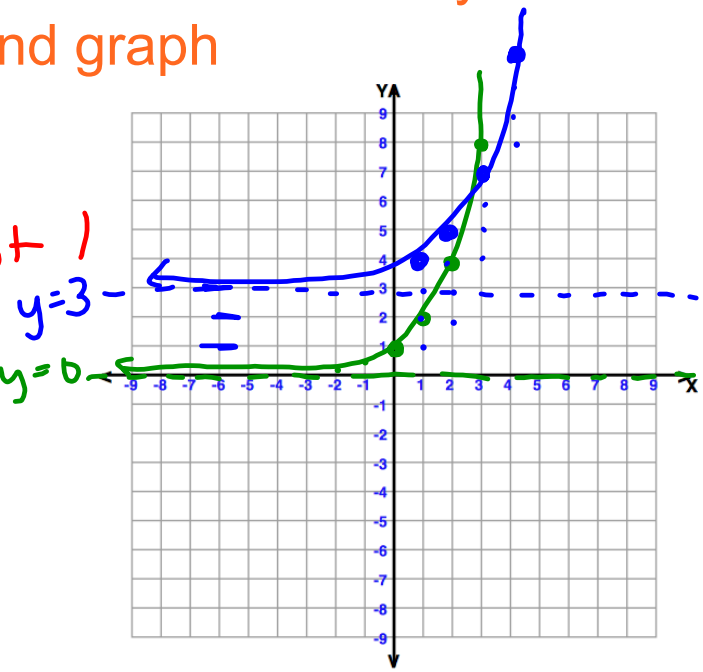
State the parent function and identify the transformations and graph

$f(x) = 2^x$

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

H. Shift Right 1

V. Shift Up 3



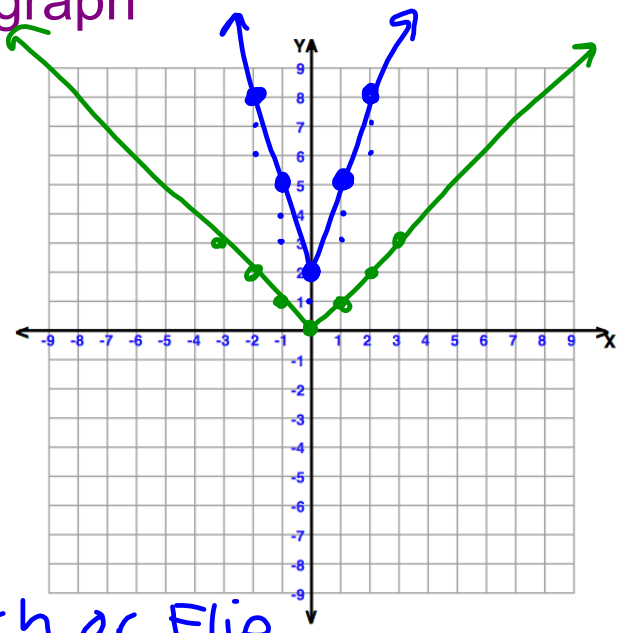
State the parent function and identify the transformations and graph

$f(x) = |x|$

$y = 3|x| + 2$

V. Stretch by 3

V. Shift Up 2



★ Start with Stretch or Flip