

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	Horizontal <i>attached to x's</i>
Shift <i>Adding/sub</i>	$f(x) \pm k$	$f(x \pm h)$
Stretch/Compress <i>multiplying</i>	$a f(x)$	$f(bx)$
Reflection/Flip	$-f(x)$	$f(-x)$

V. Stretch/compression:
 if $a > 1 \Rightarrow$ Stretch
 $a < 1 \Rightarrow$ Compression

H. Stretch/compression:
 if $b > 1 \Rightarrow$ compress.
 $b < 1 \Rightarrow$ Stretch

Information to remember about transformations....

x's lie

Horizontal

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

Ex. 1 State the transformations:

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

Shift down
by 2

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

V. Stretch by
2

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

* Flip
Vertically
(Reflect across x-axis)

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

H. Compress
by 3 or $\frac{1}{3}$

Parent: $g(x) = \sqrt{x}$

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

Shift Left
by 3

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

V. Compression
by $\frac{1}{3}$

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

Flip Horiz.

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

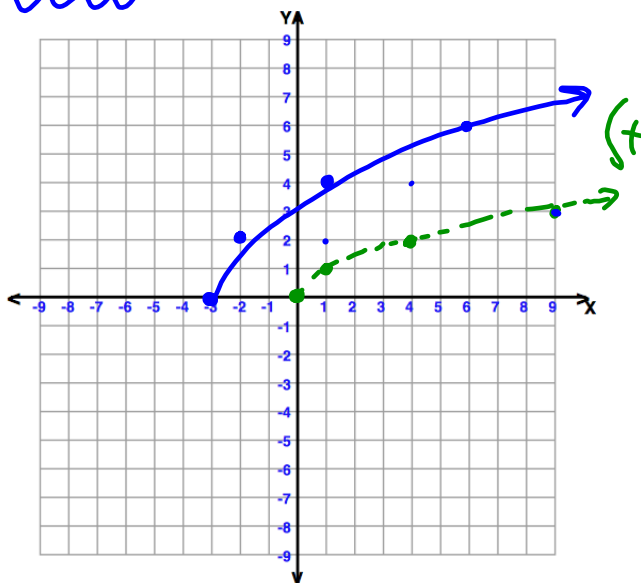
H. Stretch
by 8

State the parent function and identify the transformations and graph

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

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

- V. Stretch by 2
- Shift Left 3

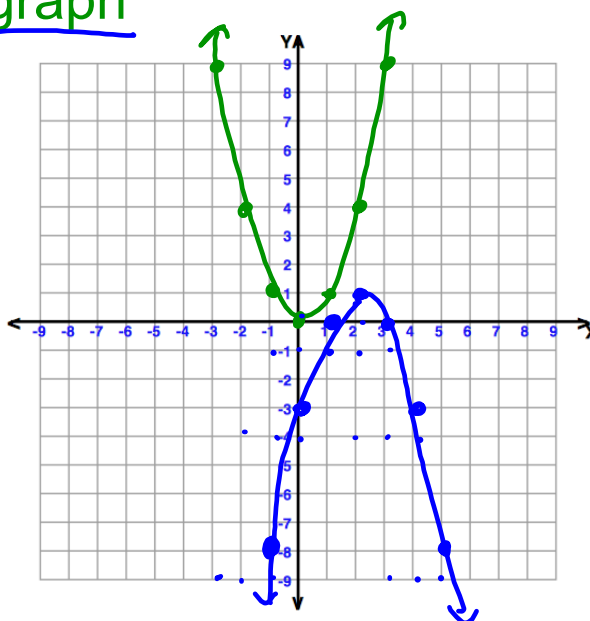


State the parent function and identify the transformations and graph

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

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

- V. Flip
- Shift Right 2
- Shift up 1



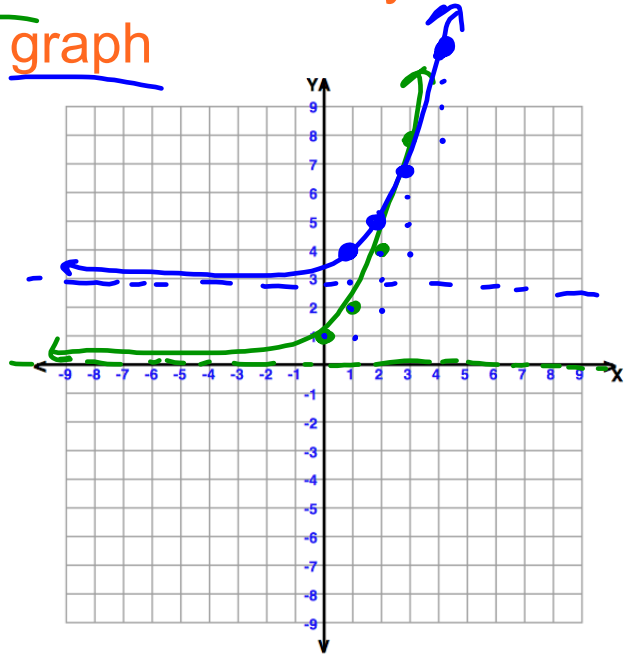
State the parent function and identify the transformations and graph

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

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

Shift Right + 1

Shift Up 3



State the parent function and identify the transformations and graph

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

