

1-2 Transformations

Objectives:

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

Information to remember about transformations....

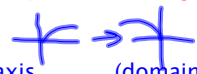
x's lie

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

Domain changes
Range changes

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

- \pm if (-) reflection over x-axis (range Δ)
- a vertical expansion or compression (range Δ)
 - $a > 1$ expansion
 - $a < 1$ compression
- \pm if (-) reflection over y-axis (domain Δ)
- b horizontal expansion or compression (domain Δ)
 - $0 < b < 1$ expansion
 - $b > 1$ compression
- h translation left or right (domain Δ)
 - (+) left (-) right
- k translation up or down (range Δ)
 - (+) up (-) down



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

Ex. 1 State the transformations:

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

down 2

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

left

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

vertical stretch by 2

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

vertical compression of $\frac{1}{3}$

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

reflect over x-axis

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

reflect over y-axis

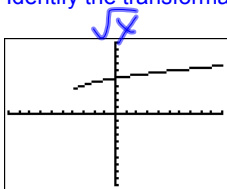
$$f(x) = \sqrt{3x}$$

horizontal compression of 3

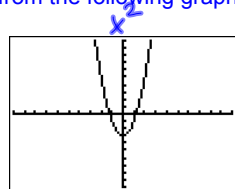
$$f(x) = \sqrt{\frac{1}{8}x}$$

horizontal stretch of $\frac{1}{8}$

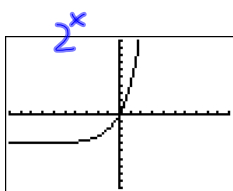
Identify the transformations from the following graphs



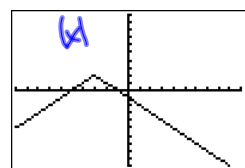
left/up



down



down/left



left/up reflected

State the parent function and identify the transformations and graph

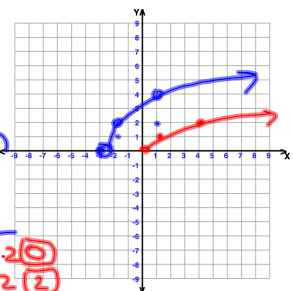
$$y = 2\sqrt{x+3}$$

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

- vertical stretch of 2

- left 3

x	y
-3	0
-2	1
-1	2

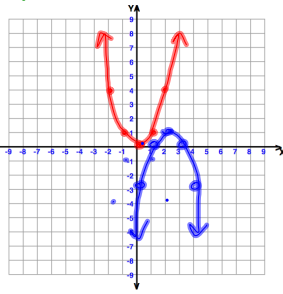


State the parent function and identify the transformations and graph

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

$$y = x^2$$

- reflect over x-axis
- right 2
- up 1



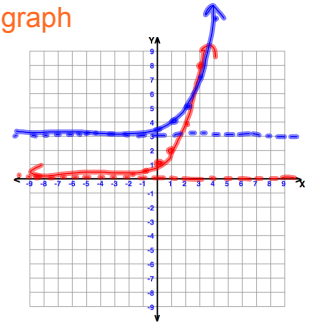
State the parent function and identify the transformations and graph

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

$$y = 2^x$$

- Right 1
- up 3

x	y
-2	1/4
-1	1/2
0	1
1	2
2	4
3	8



State the parent function and identify the transformations and graph

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

$$y = |x|$$

- up 2
- vertical stretch of 3

