5-2 Graphing Radical Functions

Objectives:

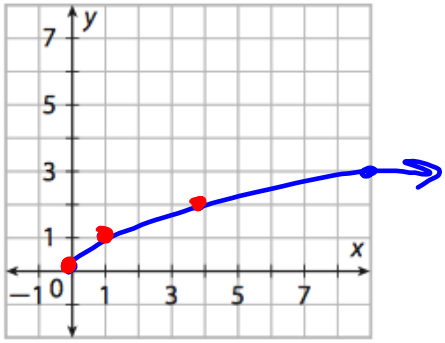
- I can graph square and cube root functions with and without transformations

- I can identify Domain and Range

Graph the following and state the domain, range, and end behavior

x y

x	$f(x) = \sqrt{x}$
0	0
1	1
4	2
9	3



Domain: $[0, \infty)$

Range: $[0, \infty)$

End Behavior

Transformation Form

$$f(x)=a\sqrt{\frac{1}{b}(x-h)}+k$$

V. Stretch

H. Shift (L/R)

V. Shift (Up/Down)

inside = Horizontal (x's lie)

H. Stretch by b

outside = Vertical

State the transformations

$$g(x)=2\sqrt{x-3}-2$$

V. Stretch by 2

Shift Right by 3

Shift Down 2

$$f(x)=\sqrt{-\frac{1}{2}(x-2)}+1$$

H. Flip

H. Stretch by 2

Shift Right 2

Shift Up 1

Find the Domain and Range

$$g(x)=2\sqrt{x-3}-2$$

V. Stretch by 2

Shift Right 3

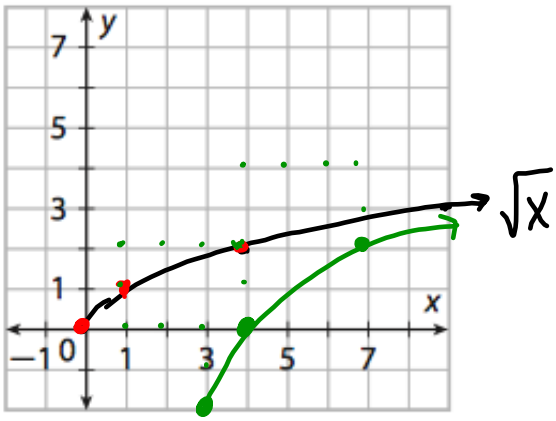
$$f(x)=\sqrt{-\frac{1}{2}(x-2)}+1$$

Graph the following and state the end behavior

$$g(x)=2\sqrt{x-3}-2$$

V. Stretch ↑ 2

Shift → 3 ↓ 2



~~End Behavior~~

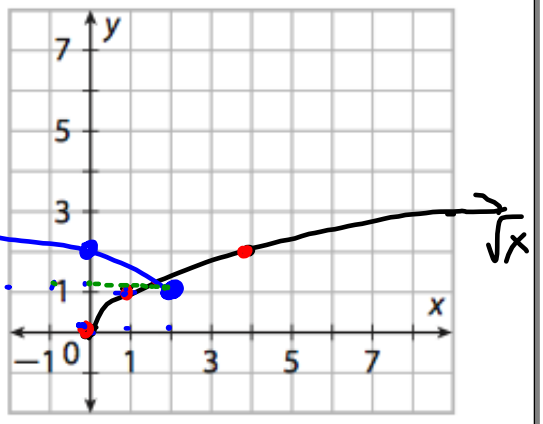
Domain: $[3,\infty)$

Range: $[-2,\infty)$

Graph the following and state the end behavior

$$f(x)=\sqrt{-\frac{1}{2}(x-2)}+1$$

H Flip
H. Stretch 2
Shift → 2
↑ 1

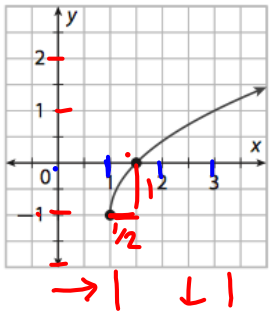


~~End Behavior~~

D: $(-\infty,2]$

R: $[1,\infty)$

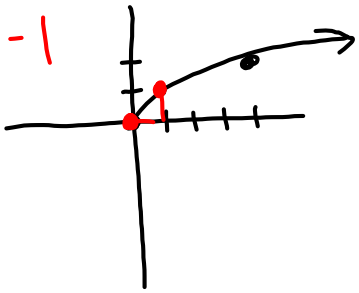
Write a function to represent the following

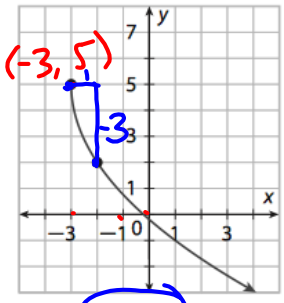


→1 ↓1

$f(x) = \sqrt{2(x-1)} - 1$

H. Stretch by ½





←3 ↑5

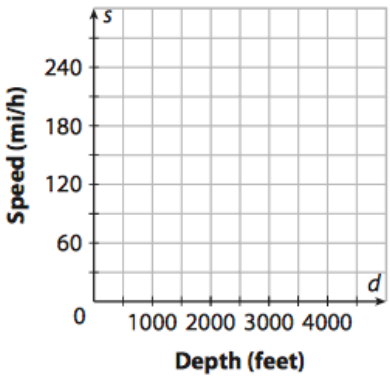
V. Flip

$f(x) = -3\sqrt{x+3} + 5$

V. Flip

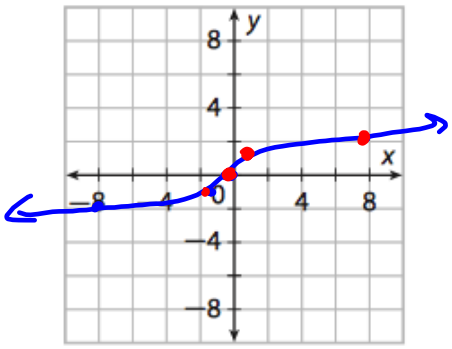
V. Stretch 3

The speed in miles per hour of a tsunami can be modeled by the function $s(d) = 3.86\sqrt{d}$, where d is the average depth in feet of the water over which the tsunami travels. Graph this function from depths of 1000 feet to 5000 feet and compare the change in speed with depth from the shallowest interval to the deepest. Use depths of 1000, 2000, 3000, 4000, and 5000 feet for the x-values.



Graph the following and state the domain, range, and end behavior $f(x)=\sqrt[3]{x}$

x	y	x, y
−8	-2	(-8, -2)
−1	-1	
0	0	
1	1	
8	2	



Domain: $(-\infty, \infty)$ End Behavior

Range: $(-\infty, \infty)$

State the transformations and Domain and Range

$g(x)=2\sqrt[3]{x-3}+5$

V. Stretch by 2

Shift Right by 3

Shift Up by 5

$f(x)=\sqrt[3]{\frac{1}{2}(x-10)}+4$

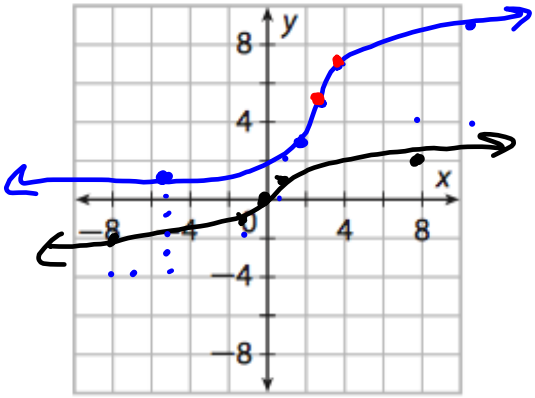
H. Stretch by 2

Shift Right 10

Shift up 4

Graph the following and state the end behavior

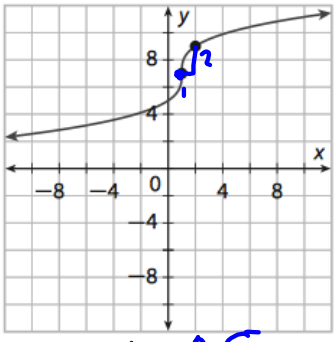
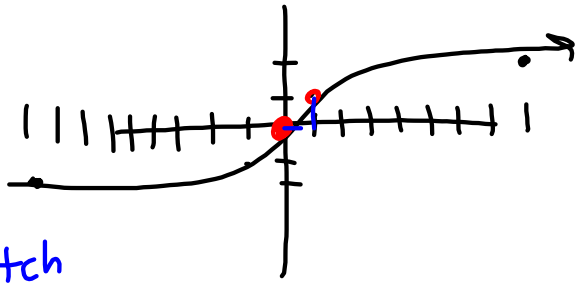
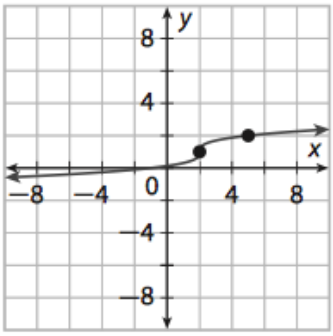
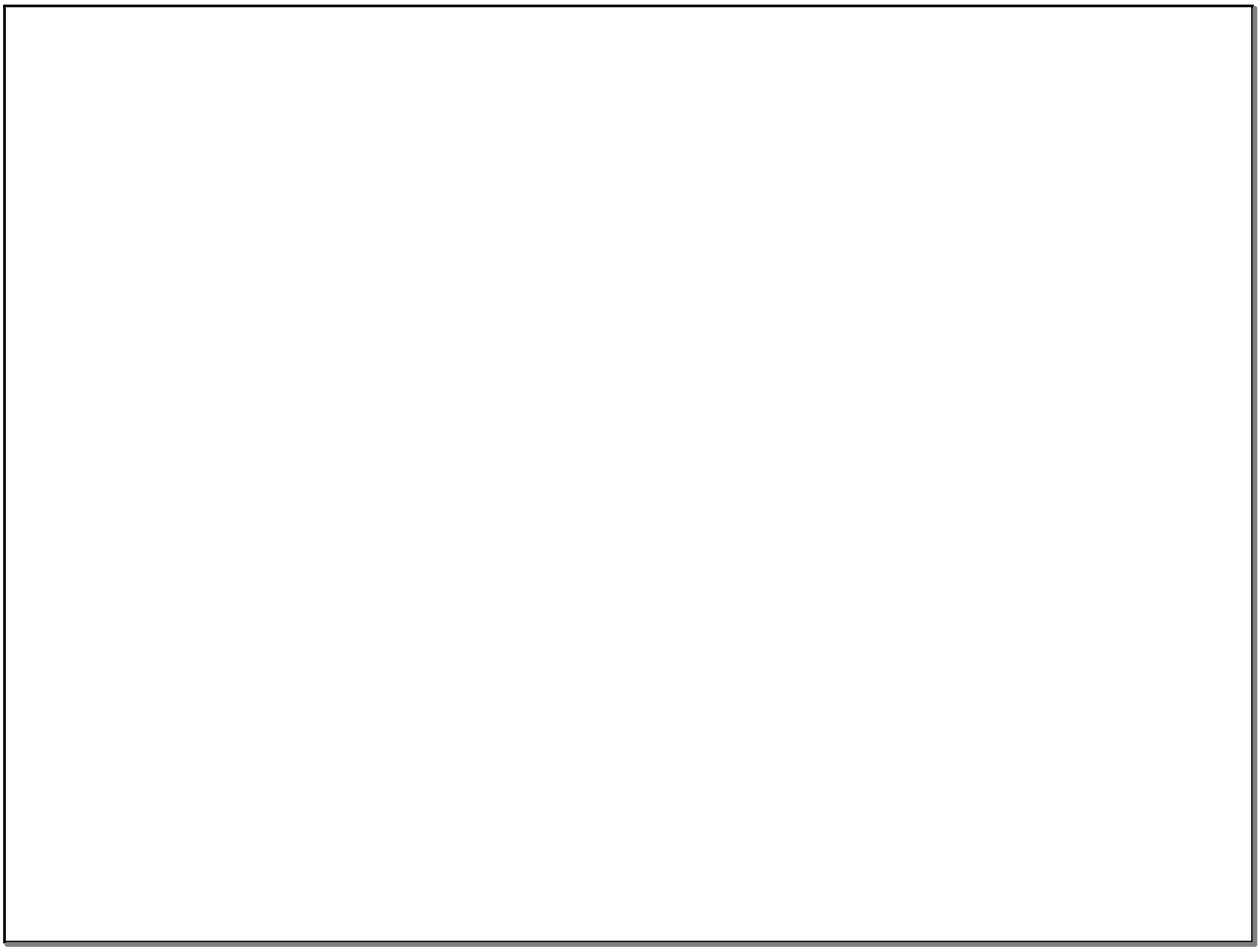
$$g(x) = 2\sqrt[3]{x-3}+5$$



End Behavior

D: $(-\infty, \infty)$ R: $(-\infty, \infty)$

Write an equation to represent the following



→1 ↑5 V. Stretch by 2