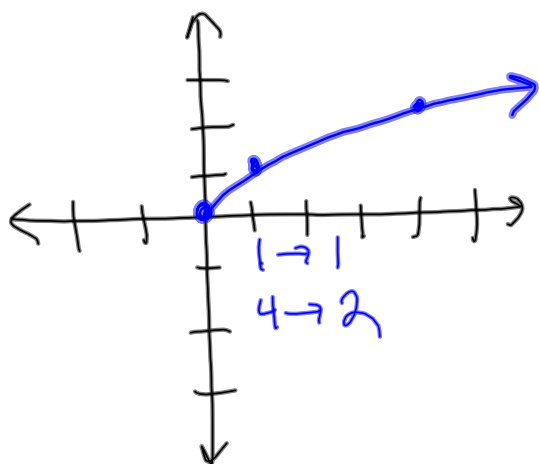


## Sec. 6.8 Graphing Radical Functions

Parent function :  $y = \sqrt{x}$        $y = \sqrt[n]{x}$



$x$	$y$
-2	$\sqrt{-2} = i\sqrt{2} \times$
0	$\sqrt{0} = 0$
1	$\sqrt{1} = 1$
4	$\sqrt{4} = 2$

Parent

Reflection in  $x$ -axis

Vertical!

Stretch  $|a| > 1$

Compression  $|a| < 1$

Translation

Horizontal  $h$

Vertical  $k$

Square Root

$$y = \sqrt{x}$$

$$y = -\sqrt{x}$$

$$y = a\sqrt{x}$$

$$y = \sqrt{x-h} + k$$

Radical

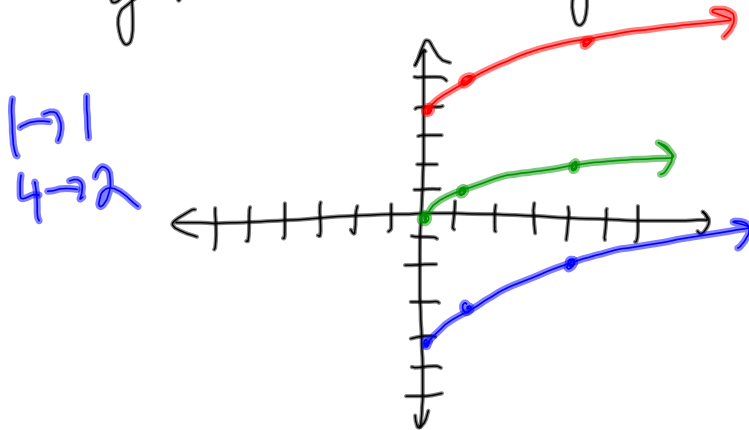
$$y = \sqrt[n]{x}$$

$$y = -\sqrt[n]{x}$$

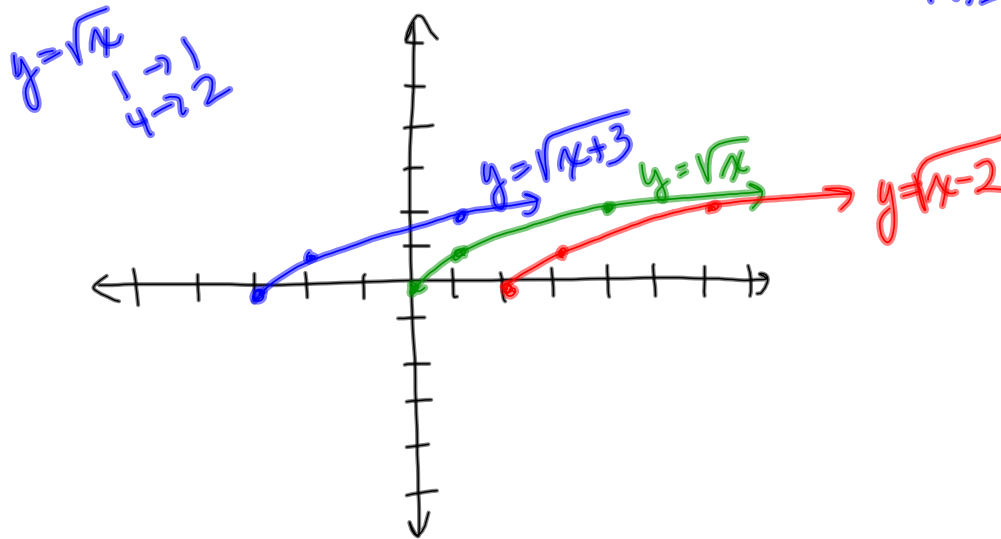
$$y = a\sqrt[n]{x}$$

$$y = \sqrt[n]{x-h} + k$$

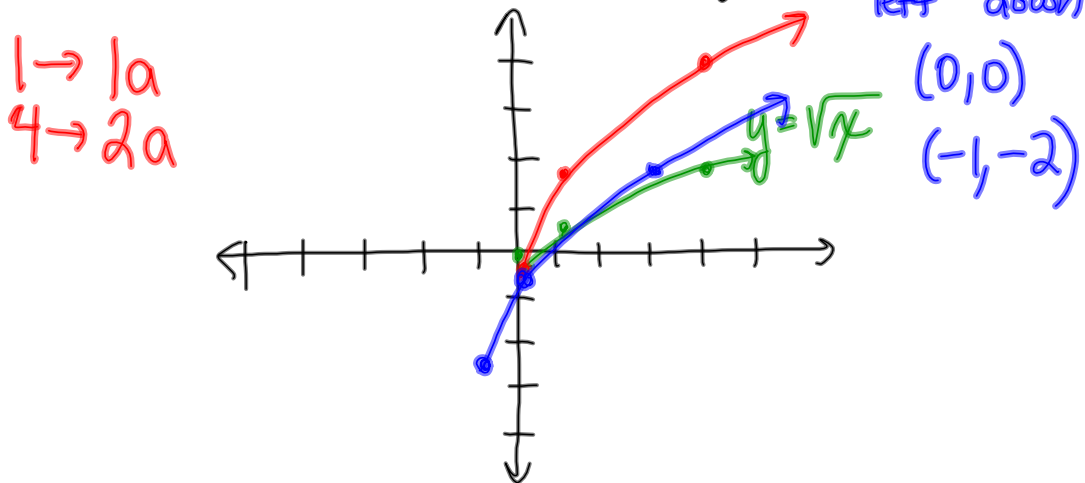
Ex 1: What are the graphs of  $y = \sqrt{x} + 4$  and  $y = \sqrt{x} - 4$



Ex 2: What are the graphs of  $y = \sqrt{x-2}$ ,  $y = \sqrt{x+3}$



Ex 3: What is the graph of  $y = 2\sqrt{x+1} - 2$ ?



Ex 4:  $r = \sqrt[3]{\frac{3V}{4\pi}}$  radius of a sphere

If  $r = 4.5$  in., what is the volume of the balloon?

$$(4.5)^3 = \left( \sqrt[3]{\frac{3V}{4(3.14)}} \right)^3$$

$$12.56 \cdot 91.125 = \frac{3V}{12.56} \cdot 12.56$$

$$\frac{1144.53}{3} = \frac{3V}{3}$$

$$381.51 = V$$

$$382 \text{ in}^3$$

$$y = \sqrt{x}$$

$$\left( \frac{y}{5} \right)^2 = (\sqrt{x})^2$$

$$25 = x$$

$$y = \sqrt{\frac{4x-12}{4.7-4.3}}$$

$$y = \sqrt{4(x-3)}$$

$$y = \sqrt{4} \cdot \sqrt{x-3}$$

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

$$y = \sqrt{\frac{9x+18}{9}}$$

$$y = \sqrt{9(x+2)}$$

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