

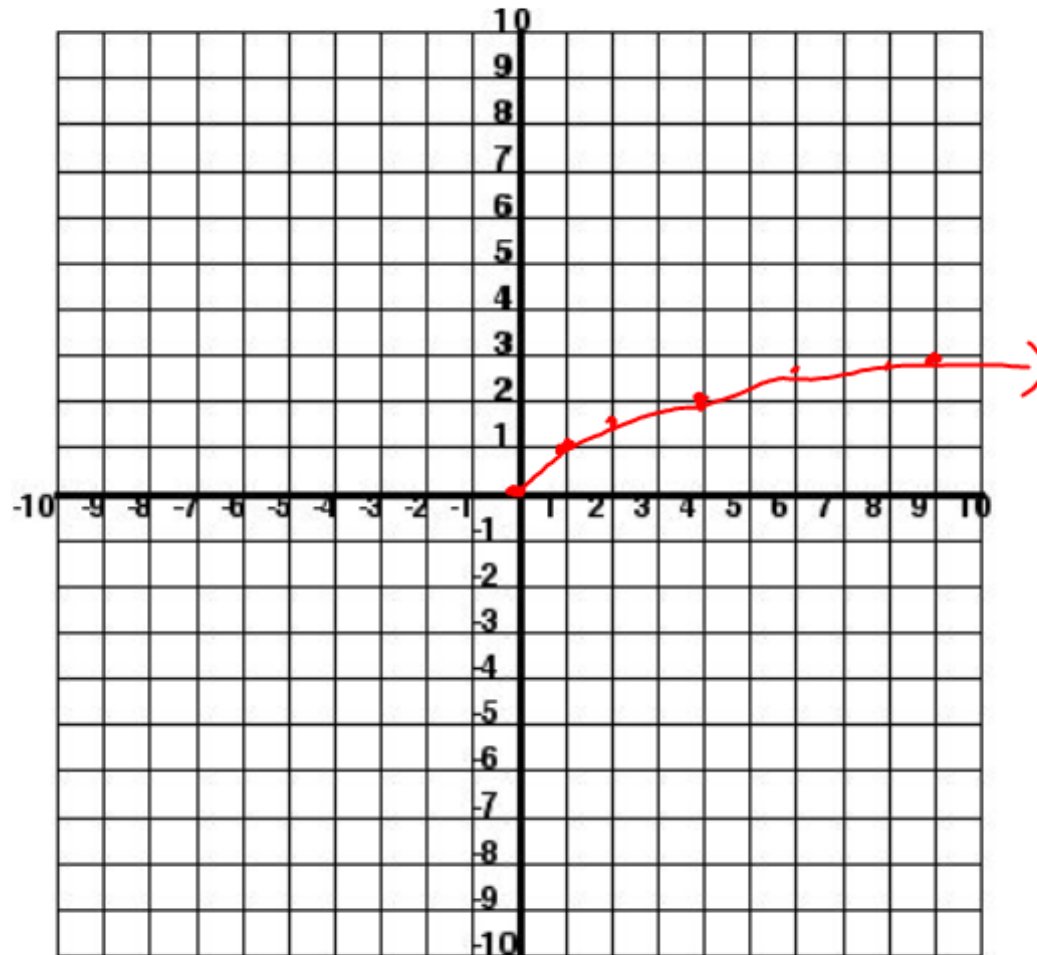
## 6.5 Graph Square Root and Cube Root Functions

Square Root Parent Function:

Graph:  $y = \sqrt{x}$

x	0	1	4	9	16	25	36	49
y	0	1	2	3	4	5	6	7

Domain: Non neg.  
 $x \geq 0$   
Range: Non neg.  
 $y \geq 0$



Remember graphing in vertex form:

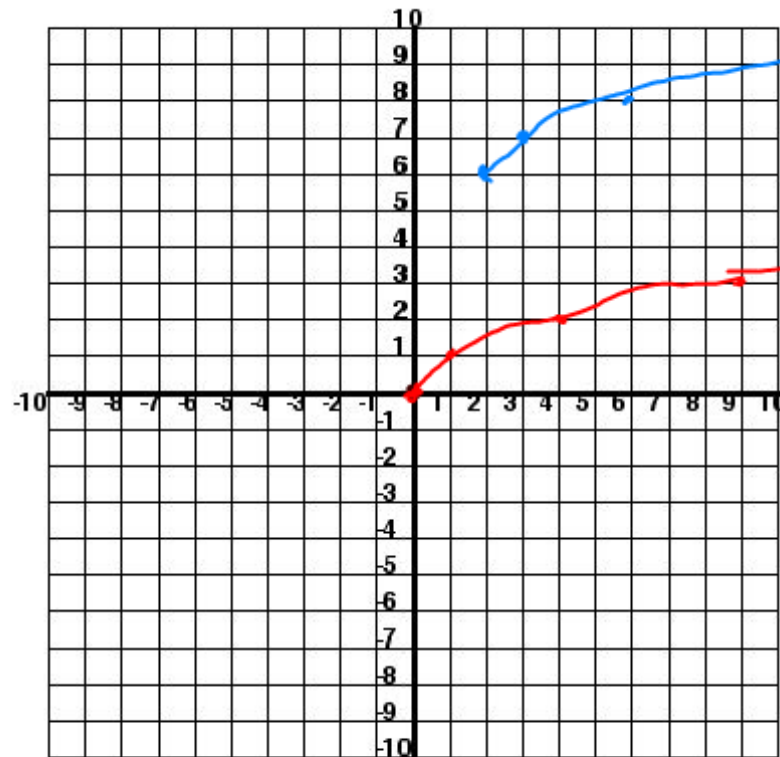
$$y = a(x - h)^2 + k$$

Now graph

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

x	2	3	1
y	6	7	X

Example: Graph:  $y = \sqrt{x - 2} + 6$

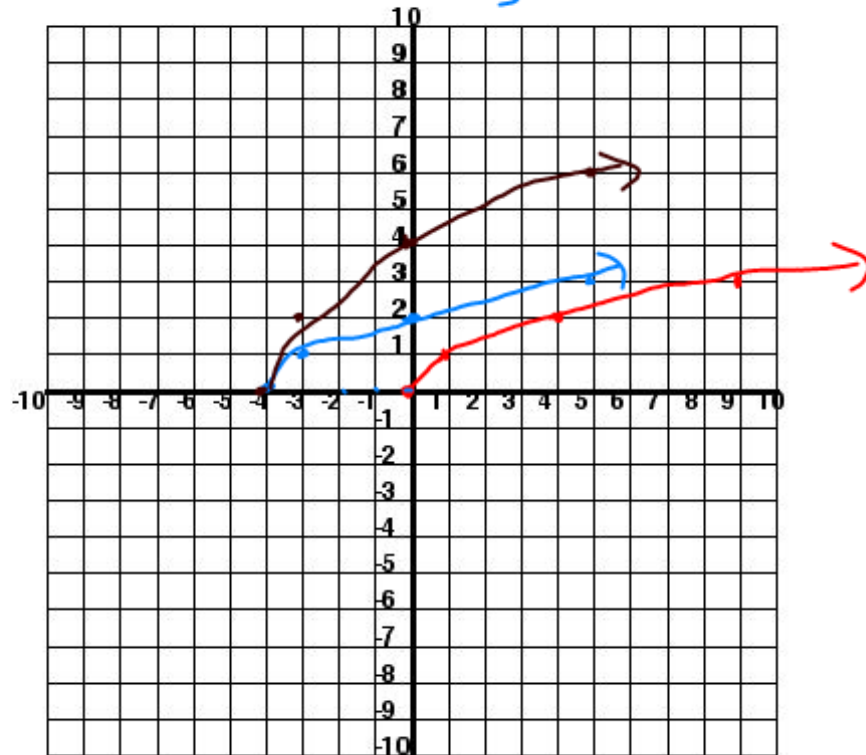


Domain:  $x \geq 2$   
 Range:  $y \geq 6$

Example: Graph:  $y = 2\sqrt{x+4}$

$$y = \sqrt{x} \quad \leftarrow 4$$

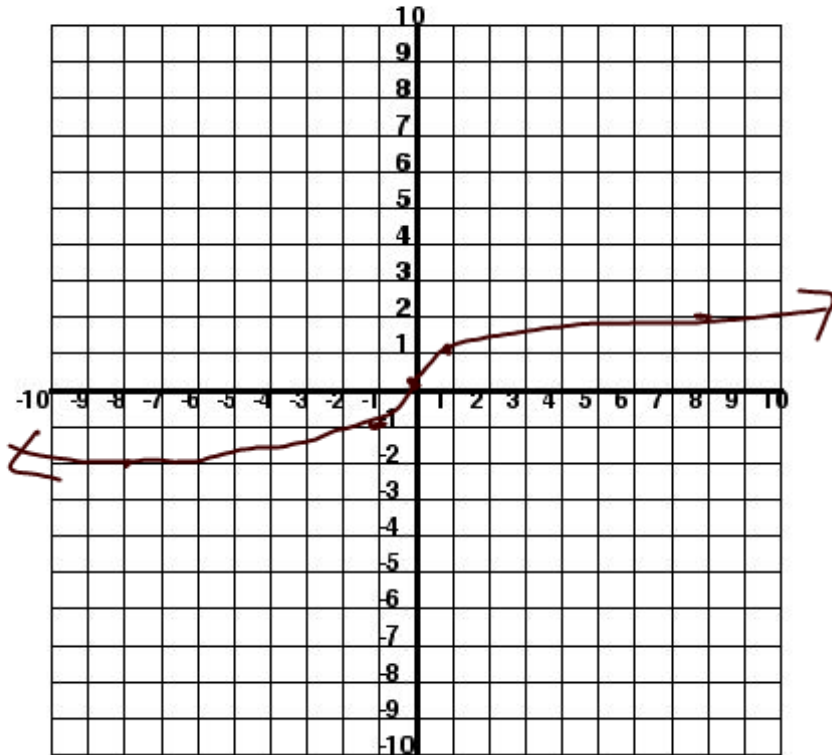
$$y = \sqrt{x+4}$$



Domain:  $x \geq -4$   
 Range:  $y \geq 0$

Parent graph  $y = \sqrt[3]{x}$

x	0	1	8	-1	-8
y	0	1	2	-1	-2



Domain:  $\mathbb{R}$  - all real #'s

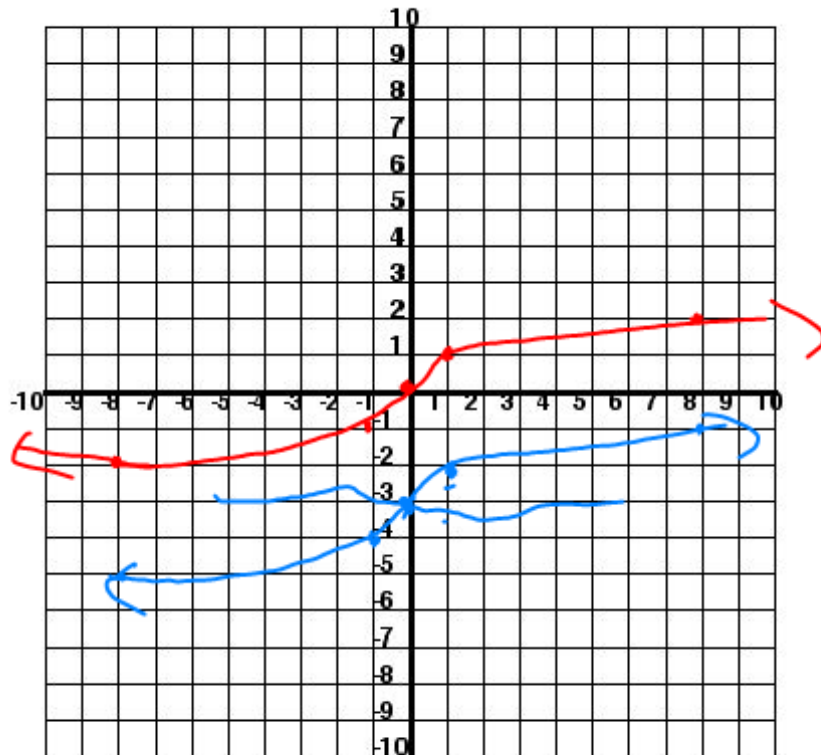
Range:  $\mathbb{R}$  - all real #'s

Now graph

$$y = a\sqrt[3]{x - h} + k$$

Example: graph  $y = \frac{-1}{2}\sqrt[3]{x - 3}$

Domain:  
Range:



Do on graph paper.

pg 449 #3, 4, 10, 12, 16 - 19, 21, 23, 26, 28, 30, 31

**SQUARE ROOT FUNCTIONS** Graph the function. Then state the domain and range.

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

4.  $f(x) = \frac{1}{2}\sqrt{x}$

**CUBE ROOT FUNCTIONS** Graph the function. Then state the domain and range.

10.  $y = \frac{1}{4}\sqrt[3]{x}$

12.  $f(x) = -5\sqrt[3]{x}$

**RADICAL FUNCTIONS** Graph the function. Then state the domain and range.

16.  $f(x) = 2\sqrt{x-1} + 3$

17.  $y = (x+1)^{1/2} + 8$

18.  $y = -4\sqrt{x-5} + 1$

19.  $y = \frac{3}{4}x^{1/3} - 1$

21.  $h(x) = -3\sqrt[3]{x+7} - 6$

23.  $g(x) = -\frac{1}{3}\sqrt[3]{x} - 6$

26. **ERROR ANALYSIS** A student tried to explain how the graphs of  $y = -2\sqrt[3]{x}$  and  $y = -2\sqrt[3]{x+1} - 3$  are related. Describe and correct the error.

The graph of  $y = -2\sqrt[3]{x+1} - 3$  is the graph of  $y = -2\sqrt[3]{x}$  translated right 1 unit and down 3 units.



**REASONING** Find the domain and range of the function without graphing. Explain how you found your answers.

28.  $y = \sqrt{x+5}$

30.  $y = \frac{1}{3}\sqrt{x} - 4$

31.  $y = \frac{1}{2}\sqrt[3]{x+7}$