

C.4 Graphing Radical Functions

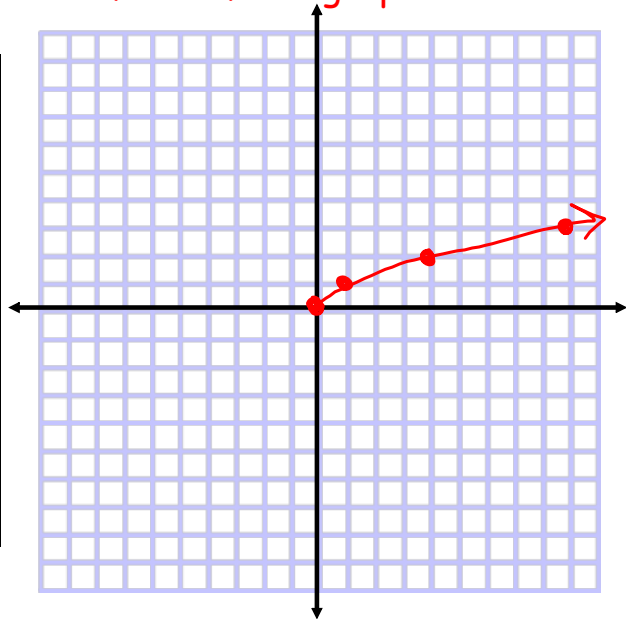
Parent Function: The most basic form of the graph.

This is the parent function of a square root radical.

$$y = \sqrt{x}$$

Lets graph it using a table to see what it looks like...

x	y
-9	3i
-4	2i
-1	i
0	0
1	1
4	2
9	3



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General Formula for a Radical Function:

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

a: Stretch / Shrink factor and Reflect over x-axis if negative.

h: horizontal (left/right shift) (* opposite sign)

k: vertical (up/down shift)

Ex1. Describe the transformation based on the parent function.

a. $y = \sqrt{x+3} + 5$
 left 3, up 5

b. $y = 2\sqrt{x} - 7$
 stretch by 2, down 7

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Ex2. Graph the following radical functions. Start with the parent function, then transform it.

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

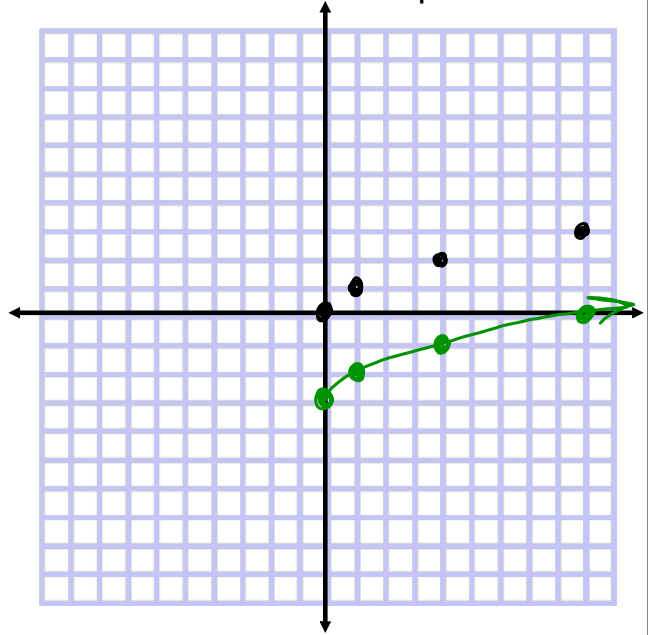
- ✓ 1. Graph the parent function first at $x = 0, 1, 4,$ and $9.$

$$y = \sqrt{x}$$

~~2. Apply any stretches or shrinks. Reflect if needed.~~

- ✓ 3. Apply any shifts.

down 3



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Ex3. Graph the following radical functions. Start with the parent function, then transform it.

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

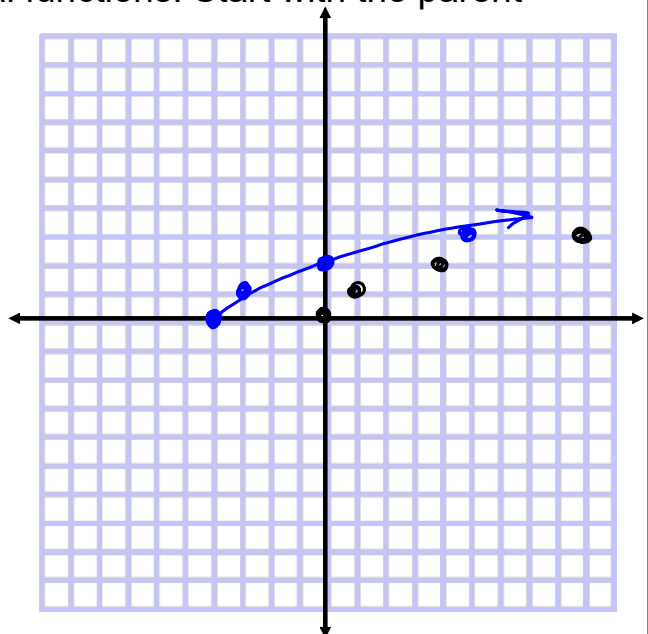
- ✓ 1. Graph the parent function first at $x = 0, 1, 4,$ and $9.$

$$y = \sqrt{x}$$

~~2. Apply any stretches or shrinks. Reflect if needed.~~

- ✓ 3. Apply any shifts.

left 4



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Ex4. Graph the following radical functions. Start with the parent function, then transform it.

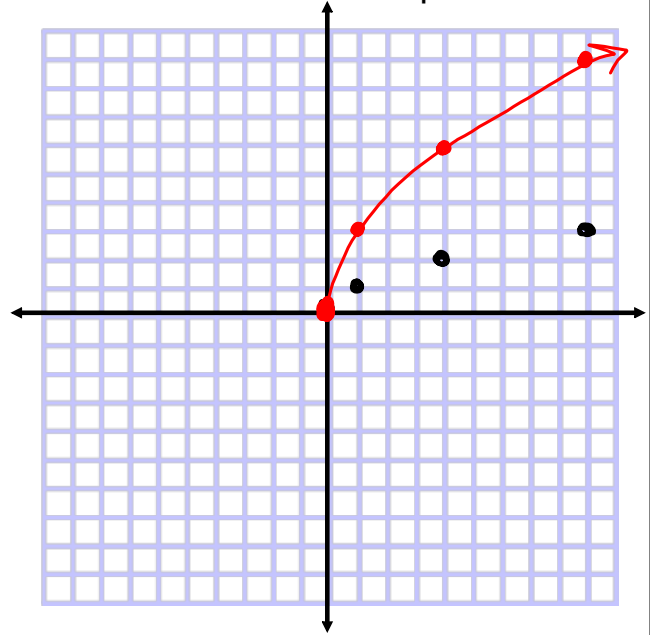
$$y = 3\sqrt{x}$$

- ✓ 1. Graph the parent function first at $x = 0, 1, 4,$ and 9 .

$$y = \sqrt{x}$$

- ✓ 2. Apply any stretches or shrinks. Reflect if needed.

~~3. Apply any shifts.~~



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Ex5. Graph the following radical functions. Start with the parent function, then transform it.

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

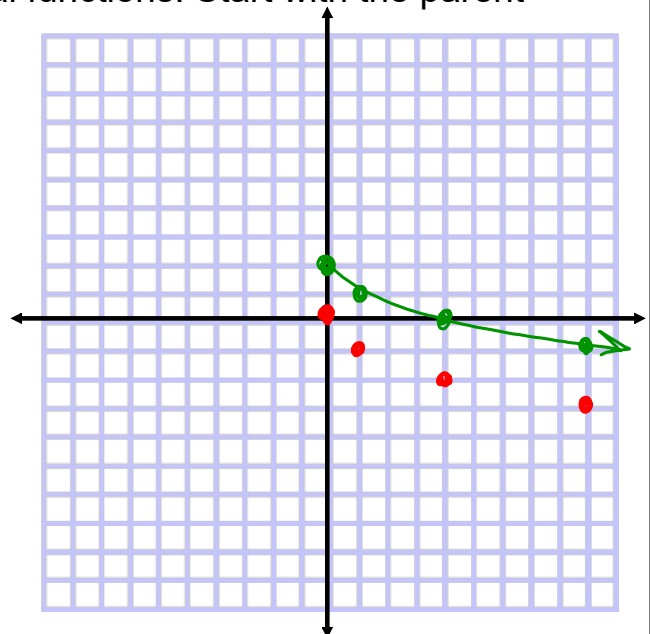
↑ multiply by -1

- ✓ 1. Graph the parent function first at $x = 0, 1, 4,$ and 9 .

$$y = \sqrt{x}$$

- ✓ 2. Apply any stretches or shrinks. Reflect if needed.

✓ 3. Apply any shifts. Up 2



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Ex6. Graph the following radical functions. Start with the parent function, then transform it.

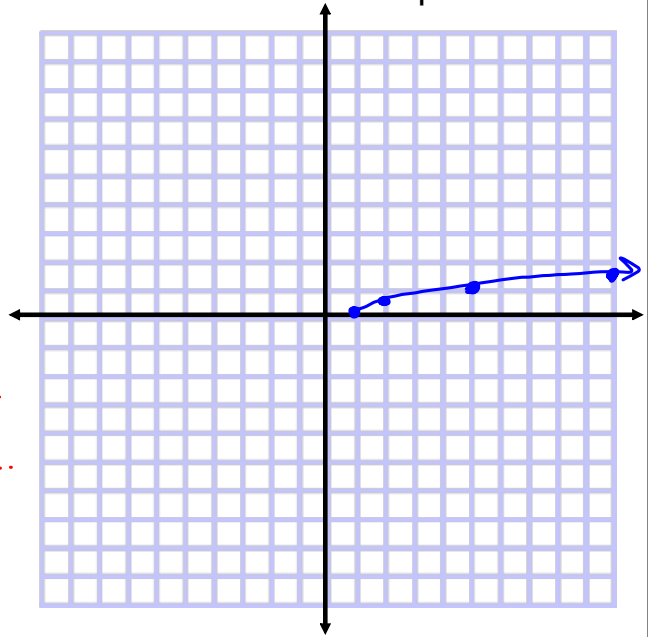
$$y = \frac{1}{2}\sqrt{x-1}$$

- ✓ 1. Graph the parent function first at $x = 0, 1, 4,$ and 9 .

$$y = \sqrt{x}$$

- ✓ 2. Apply any stretches or shrinks. Reflect if needed. *shrink by $\frac{1}{2}$.*

- ✓ 3. Apply any shifts. *Right 1.*



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Ex7. Graph the following radical functions. Start with the parent function, then transform it.

$$y = -2\sqrt{x+4} + 3$$

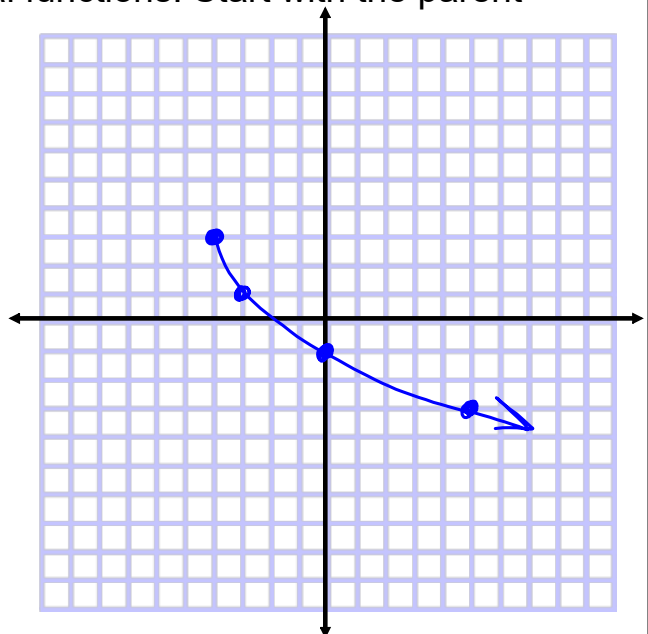
- ✓ 1. Graph the parent function first at $x = 0, 1, 4,$ and 9 .

$$y = \sqrt{x}$$

- ✓ 2. Apply any stretches or shrinks. Reflect if needed.

- ✓ 3. Apply any shifts.

Reflect over x-axis, stretch by 2, left 4 and up 3.



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