C.4 - (6.8) Graphing Radicals

A square root function is the inverse of a quadratic function, but with a restricted domain.

Ex. What is the domain/range of the parent function?

$f(x) = \sqrt{x}$ D: $x \geq 0$ R: $y \geq 0$

Ex. What is the domain/range of this function?

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

D: $x \geq 3$ R: $y \geq 5$

Jan 31-9:03 AM

take note

Key Concepts Families of Radical Functions

	Square Root
Parent function:	$y = \sqrt{x}$
Reflection in x-axis:	$y = -\sqrt{x}$
Stretch ($a > 1$), shrink ($0 < a < 1$) by the factor a:	$y = a\sqrt{x}$
Translation: Horizontal by h, Vertical by k	$y = \sqrt{x-h} + k$

still opposite x

Ex. Describe the transformation based on the parent function

$f(x) = 2\sqrt{x+3} + 4$

Stretch by 2, left 3, up 4

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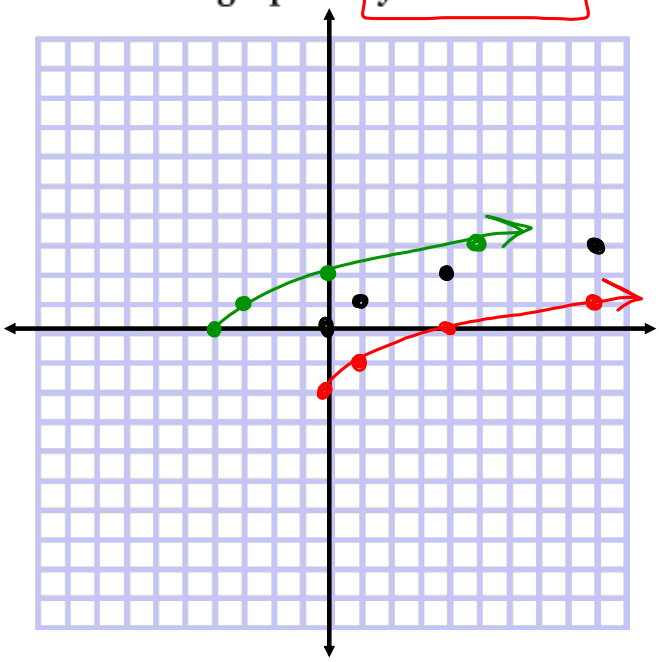
Graphing:

What are the graphs of $y = \sqrt{x} - 2$ and $y = \sqrt{x + 4}$



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

$y = \sqrt{x}$

2. Apply any stretches or shrinks.

3. Apply any shifts.

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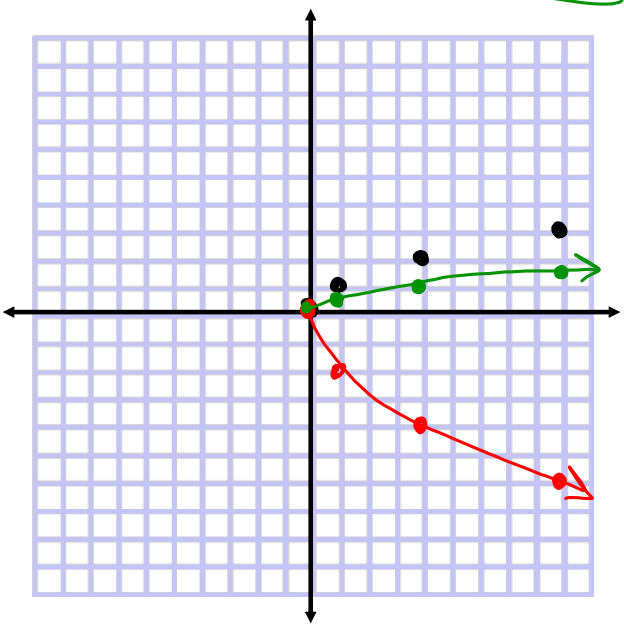
Graph $y = -2\sqrt{x}$ and $y = \frac{1}{2}\sqrt{x}$



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

$y = \sqrt{x}$

2. Apply any stretches or shrinks.

3. Apply any shifts.

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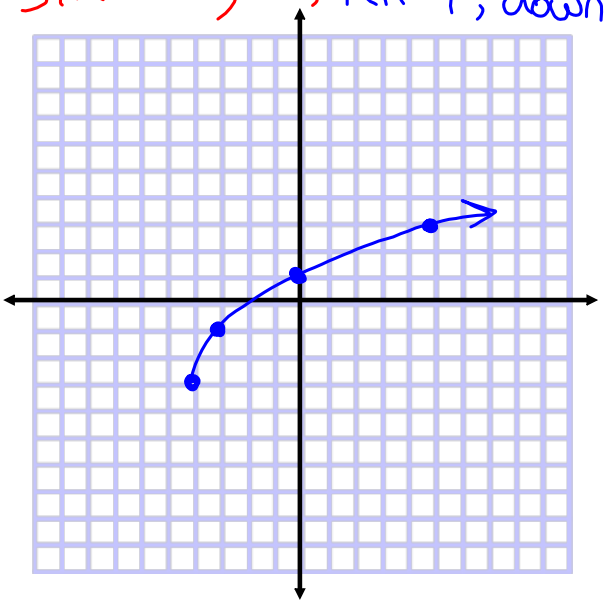
Bring it all together! Graph $y = 2\sqrt{x+4} - 3$

Stretch by 2, left 4, down 3



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

$y = \sqrt{x}$

✓ 2. Apply any stretches or shrinks.

✓ 3. Apply any shifts.

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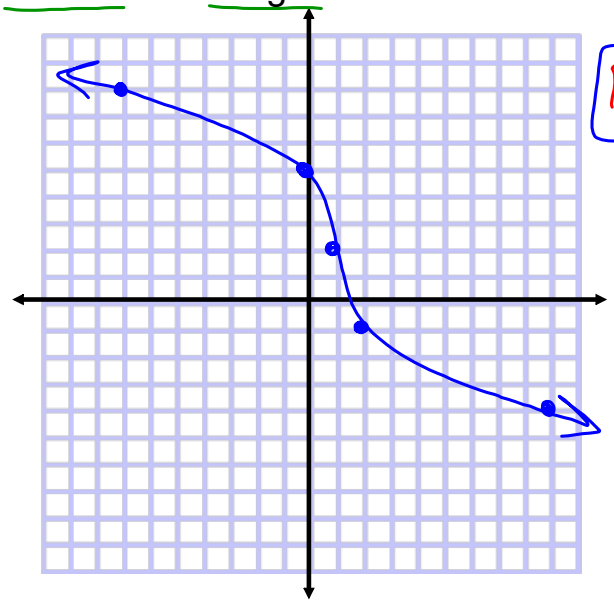
Graph and describe the transformation of the parent function. Then state the domain and range.

cube root

$y = -3\sqrt[3]{x-1} + 2$

Reflect over x-axis and stretch by 3. Right 1 and up 2.



D: All R

R: All R

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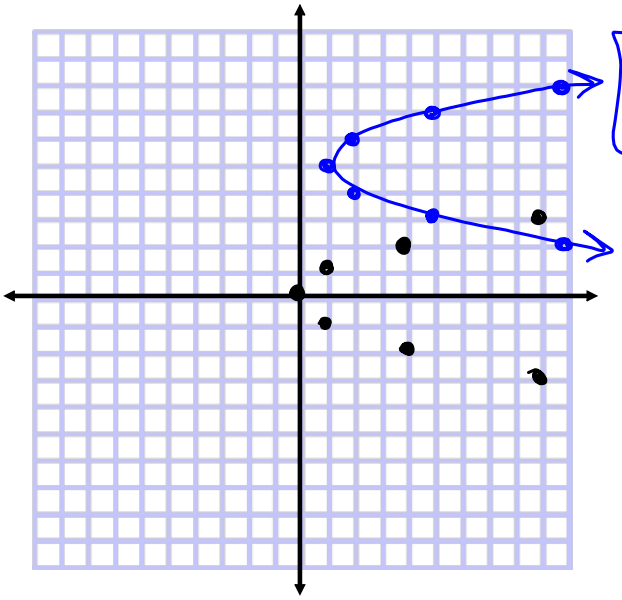
Graph and describe the transformation of the parent function. Then state the domain and range.

$$y = \pm\sqrt{x - 1} + 5$$



Right 1 and up 5

D: $x \geq 1$

R: All $\mathbb{R}$

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Rewriting a Radical Function

How can you rewrite $y = \sqrt{9x + 18}$ so you can graph it using transformations? Then describe the transformation of the parent function.

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

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

stretch by 3, left 2

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Homework

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8,11,12,15,16,19,33,35,39

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