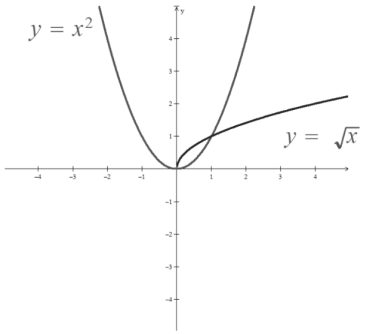
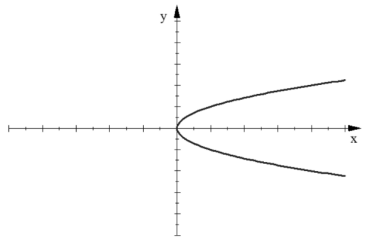


Since $(\ )^2$ and $\sqrt{\ }$ are inverses

why is the graph of $\sqrt{\ }$ only half of a sideways parabola.

The equation of the inverse is really: $y = \pm\sqrt{x}$

And this would be both halves of a sidesways parabola thus, the inverse would NOT be a function.



Therefore the graph of the inverse relation $y = \sqrt{x}$ is just the top half of a sideways parabola.

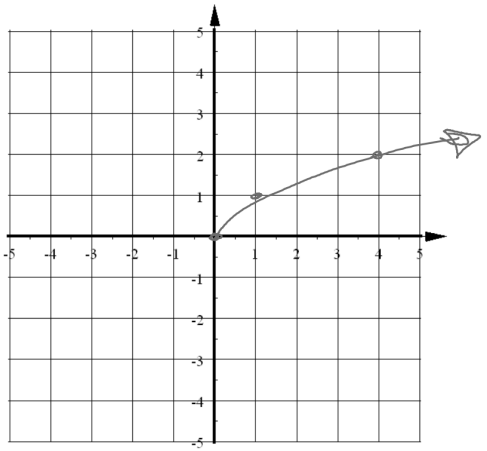
$$y = \sqrt{x}$$

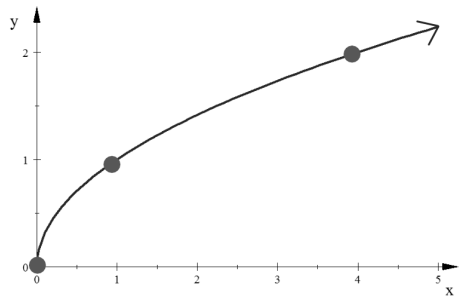
Also, without a sign in front of the radical it means the Principal Square Root (positive root).

Graph of the Parent Function:

$y = \sqrt{x}$

x	y
0	0
1	1
4	2

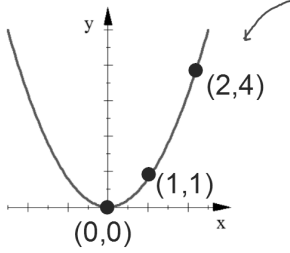




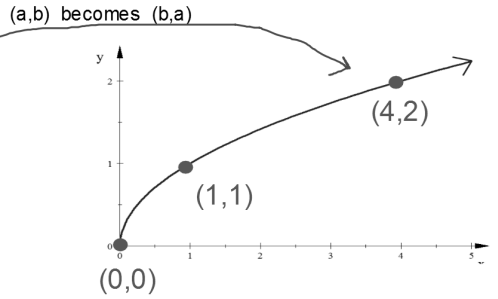
First "Good Point"

Second "Good Point"

The parent quadratic: $y = x^2$



The parent sq root: $y = \sqrt{x}$



Describe what transformations each equation models:

$$y = 2(x-5)^2 + 7$$

2 — 2 times taller (vertical stretch factor of 2)
Because this is positive the parabola opens up just like the parent function.

-5 — moved 5 units right

+7 — moved 7 units up

$$y = -\frac{1}{2}|x+6| - 8$$

-1/2 — half as tall (vertical shrink factor)
Upside down (x-axis reflection)

+6 — moved 6 units left

-8 — moved 8 units down

What do you think $y = \sqrt{x-3}$ looks like?

The parent function shifted 3 units right

What do you think $y = \sqrt{x} + 7$ looks like?

The parent function shifted 7 units up

What do you think $y = -\sqrt{x}$ looks like?

The parent function upside down x-axis reflection

What do you think $y = 3\sqrt{x}$ looks like?

The parent function 3 times taller

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

The "vertex"

(h,k)

h: Horizontal Translation

k: Vertical Translation

The new starting point
or
The new origin

a: |a|>1 Vertical Stretch

0<|a|<1 Vertical Shrink

a is neg: x-axis reflection (upside down)

Graph each using three points. Include an arrow to indicate which direction the graph continues.

$y = \sqrt{x+2} + 1$

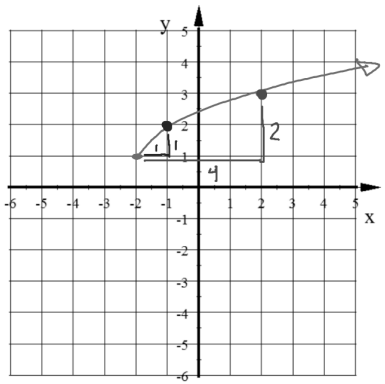
2 Left 1 up

STARTING PT
(−2, 1)

Because a=1 the first two "good pts" are the same as the parent function:

1st Good Pt:

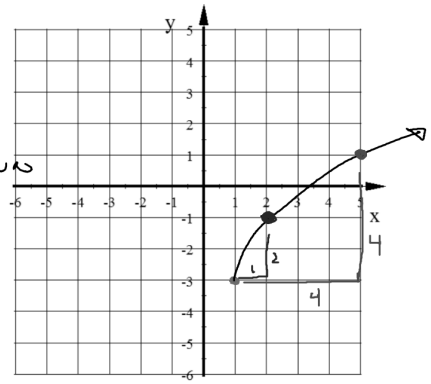
2nd Good Pt:



Graph each using three points. Include an arrow to indicate which direction the graph continues.

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

2x Taller | 1 RT | 3 DOWN



Starting Point: (1,-3)

First Good Point:

Parent Function: rise 1, run 1

This Function: rise 1 × 2 = 2, run 1

Second Good Point:

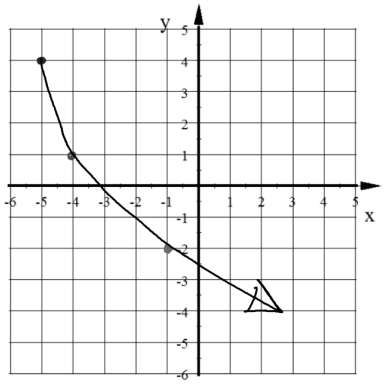
Parent Function: rise 2, run 4

This Function: rise 2 × 2 = 4, run 4

Graph each using three points. Include an arrow to indicate which direction the graph continues.

$y = -3\sqrt{x+5} + 4$

3x Taller & upside down | 5 Left | 4 up



STARTING PT: (-5, 4)

1ST PT

Parent: rise 1, run 1

This function: rise 1 × -3 = 1, run 1 → -3

2nd PT

Parent: rise 2, run 4

This function: rise 2 × -3 = 4, run 4 → -6