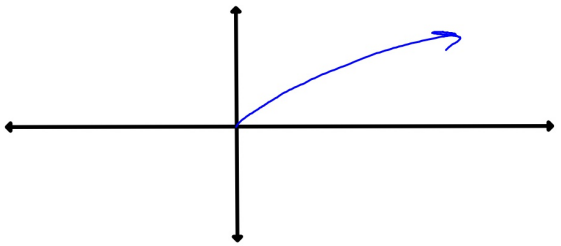
Sec 5-3: Graphing Radical Functions

The Parent Square Root Function:

$y = \sqrt{x}$

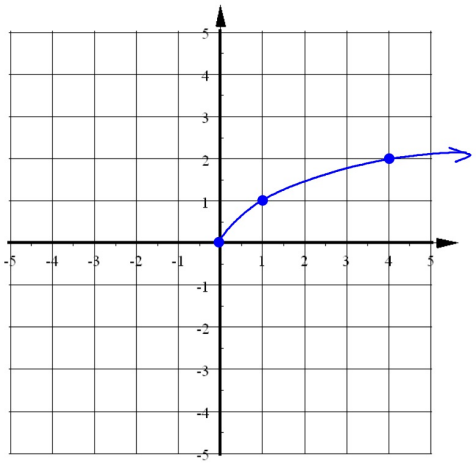
Graph will be half of a sideways parabola (inverse of a quadratic).



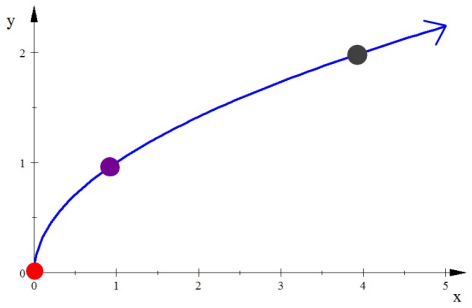
Graph of the Parent Function:

$y = \sqrt{x}$

x	y
0	0
1	1
4	2



To be able to graph x-values should be perfect squares.



First "Good Point"

1

1

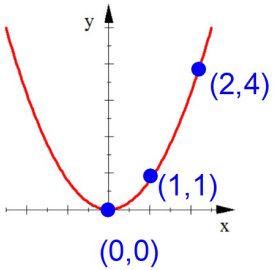
Second "Good Point"

2

4

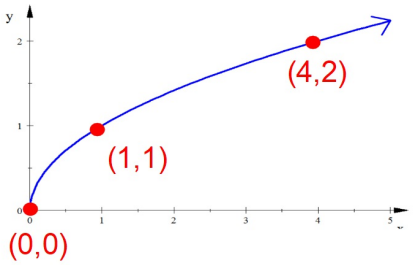
The parent quadratic:

$y = x^2$



The parent sq root:

$y = \sqrt{x}$



The points on the parent square root function are the inverse of the points on the parent quadratic function. This means that you take the parent quadratic function and switch the x and y coordinates then plot to get the parent square root function.

Describe what transformations each equation models:

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

2 → 2 times taller (vertical stretch factor of 2)

-5 → moved 5 units right

+7 → moved 7 units up

$$y = 2\sqrt{x-5} + 7$$

2 → 2 times taller (vertical stretch factor of 2)

-5 → moved 5 units right

+7 → moved 7 units up

The meaning of each value remains the same, just applied to a different parent function.

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

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)

The new starting point
or
The new origin

h: Horizontal Translation

k: Vertical Translation

a: a>1 Vertical Stretch

0<a<1 Vertical Shrink

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