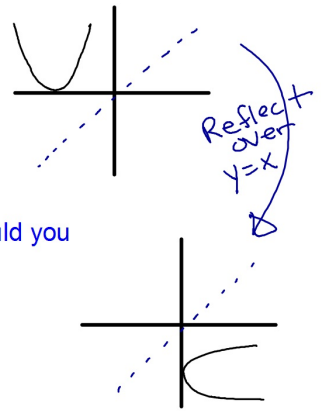
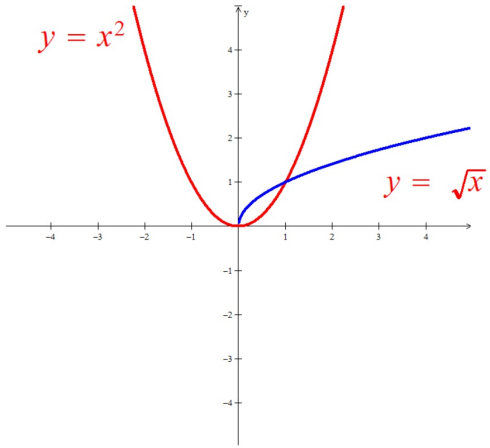
Squaring $( )^2$ and Square Root $\sqrt{\ }$ are inverses of each other.

The graph of an inverse relation is the reflection of the original graph over the line y=x.

What does the graph of $( )^2$ look like?



Since $\sqrt{\ }$ is the inverse of $( )^2$ what would you expect the graph of $\sqrt{\ }$ to look like?



Since $( )^2$ and $\sqrt{\ }$ are inverses why is the graph of $\sqrt{\ }$ only half of a sideways parabola.

$y = \sqrt{x}$

Why is the graph of the above only "half a sideways parabola"?

- If it were both halves then it wouldn't be a function.
- Without a sign in front of the radical it means the Principal Square Root (positive root).

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

Vertex:

(h,k)

h: Horizontal Translation

k: Vertical Translation

a: a>1 Vertical Stretch
0<a<1 Vertical Shrink
a is neg: x-axis reflection (upside down)

Describe the transformations to the parent function the following equation represents.

$y = -3(x + 1)^2 - 8$

- x-axis reflection (upside down)
- Vertical Stretch Factor of 3
- Shift 1 units left
- Shift 8 units down

$y = 8(x - 9)^2 - 4$

State the Vertex of this parabola.

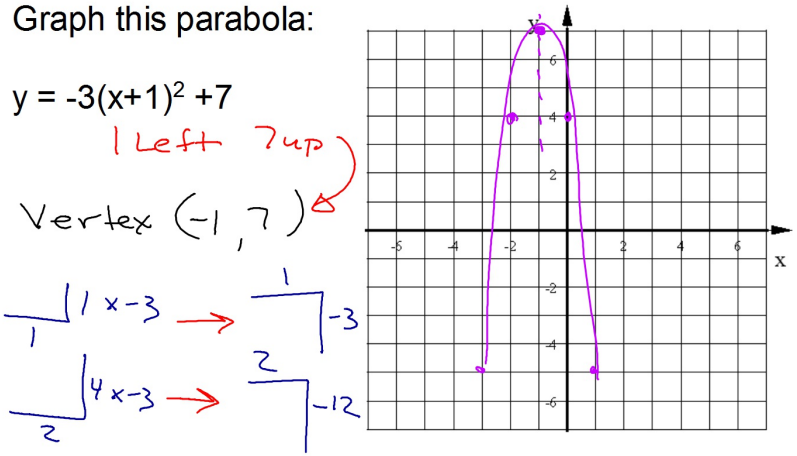
(9, -4)

Graph this parabola:

$y = -3(x+1)^2 + 7$

1 Left 7up

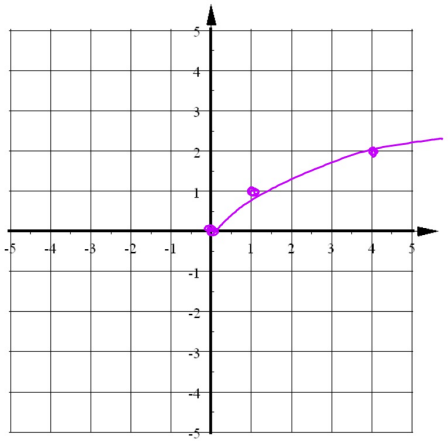
Vertex (-1, 7)

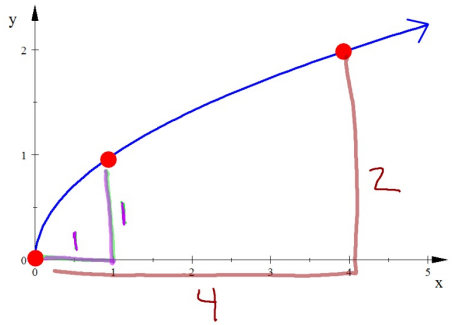


Graph of the Parent Function:

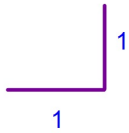
$y = \sqrt{x}$

x	y
0	0
1	1
4	2

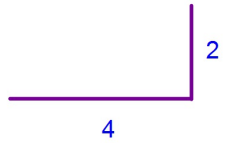




First "Good Point"



Second "Good Point"



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

The "vertex"

(h,k)

h: Horizontal Translation

k: Vertical Translation

a: a>1 Vertical Stretch

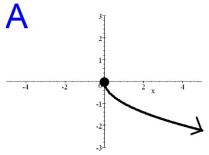
0<a<1 Vertical Shrink

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

The new starting point
or
The new origin

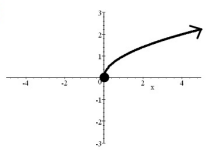
The shapes of the square root function:

A

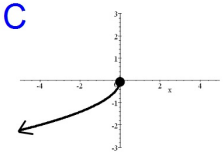


· x-axis reflection

B

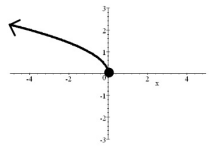


C



· x & y axis reflection

D



· y-axis reflection

Match the graphs with the equations

1. $y = -\sqrt{-x}$ C
2. $y = \sqrt{x}$ B
3. $y = -\sqrt{x}$ A
4. $y = \sqrt{-x}$ D

Graph this square root function

$y = 2\sqrt{x+3} - 5$

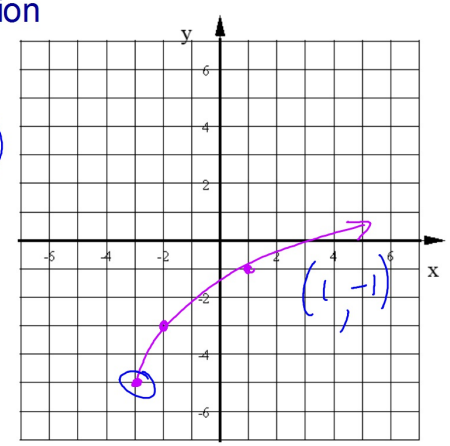
3 left 5 down

STARTING PT

$(-3, -5)$

1 x 2 → 2

2 x 2 → 4



Graph this square root function

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

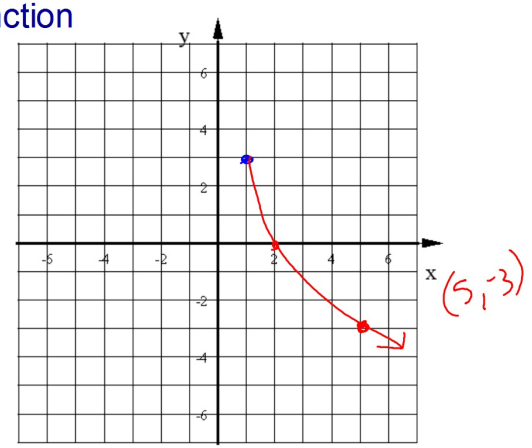
1 RT 3 up

STARTING POINT

$(1, 3)$

1 x -3 → -3

2 x -3 → -6



Graph this square root function

$y = 2\sqrt{-(x-5)} - 2$

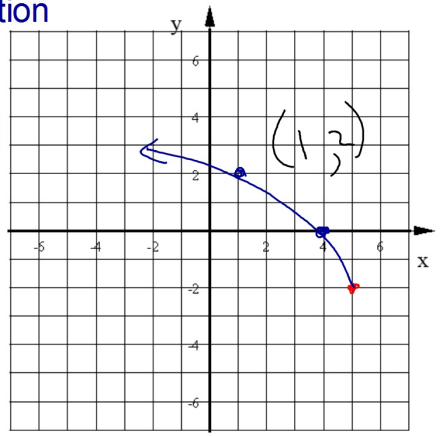
5 RT 2 down

STARTING POINT

$(5, -2)$

1 x 2 → 2

2 x 2 → 4



Graph this square root function

$y = -4\sqrt{-(x+2)} + 6$

2 left 6 up

STARTING POINT

$(-2, 6)$

1 x -4 → -4

2 x -4 → -8