

Graphing Square Root Functions Guide Notes

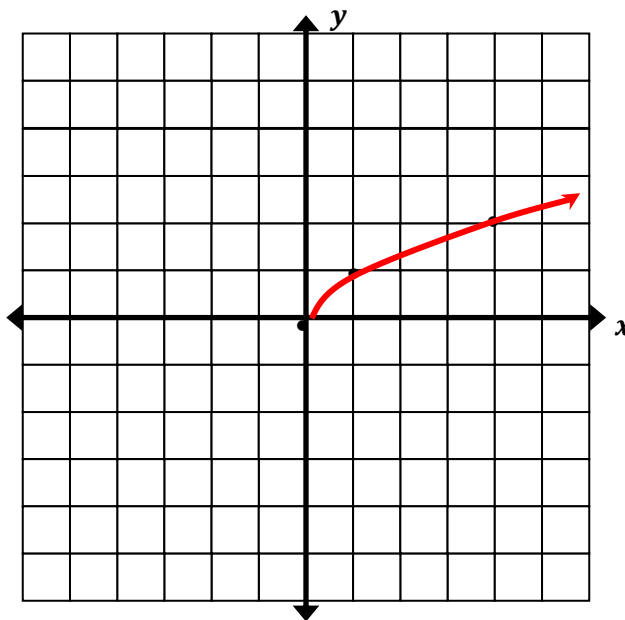
A square root function is a function containing a square root with the independent variable in the radicand. The parent square root function is $y = \sqrt{x}$.

The domain of $y = \sqrt{x}$ is $x \geq 0$.

The range of $y = \sqrt{x}$ is $y \geq 0$.

The table and graph below show the parent square root function $y = \sqrt{x}$

x	y
0	0
1	1
2	1.41
4	2



Transformations

General form of a square root function is: $y = a\sqrt{x-h} + k$

a - Represents vertical stretch or compression $a < 0$ ----- reflection across the x-axis

h - Represents **Horizontal Translation** $(x-h)$: h units to the right

$(x+h)$: h units to the left

k - Represents **Vertical Translation** $+k$: k units up

$-k$: k units down

Graphing Procedure

1. Identify the horizontal and vertical translations
2. Apply the translations to the parent square root function's table
3. Graph the coordinate points
4. Identify the Domain & Range

Graphing Square Root Functions Guide Notes

Sample Problem 1 Graph each function and identify its domain and range

a. $y = \sqrt{x + 2}$

1.

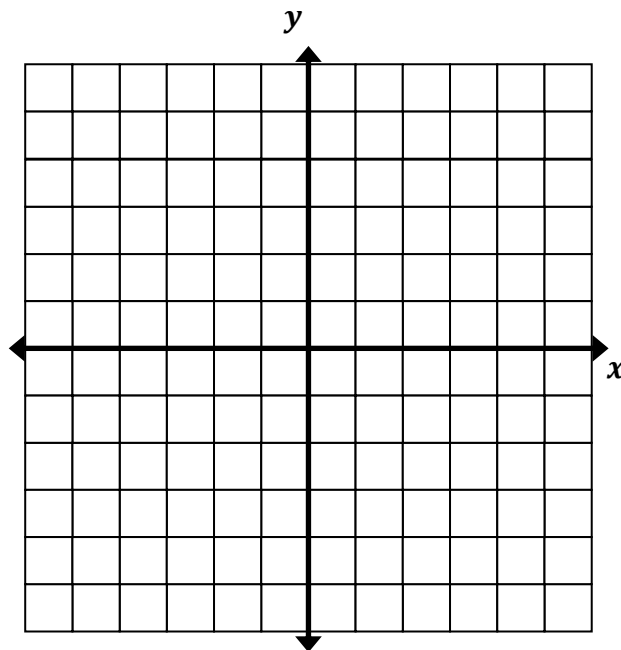
2. Table

x	y

5. Graph

6. Domain

Range



b. $y = \sqrt{x} + 1$

1.

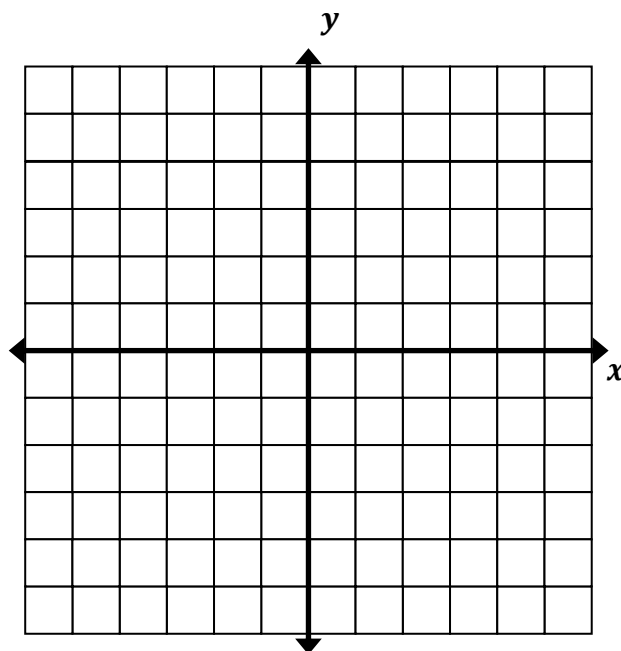
2. Table

x	y

3. Graph

4. Domain

Range



Graphing Square Root Functions Guide Notes

c. $y = \sqrt{x + 4} + 1$

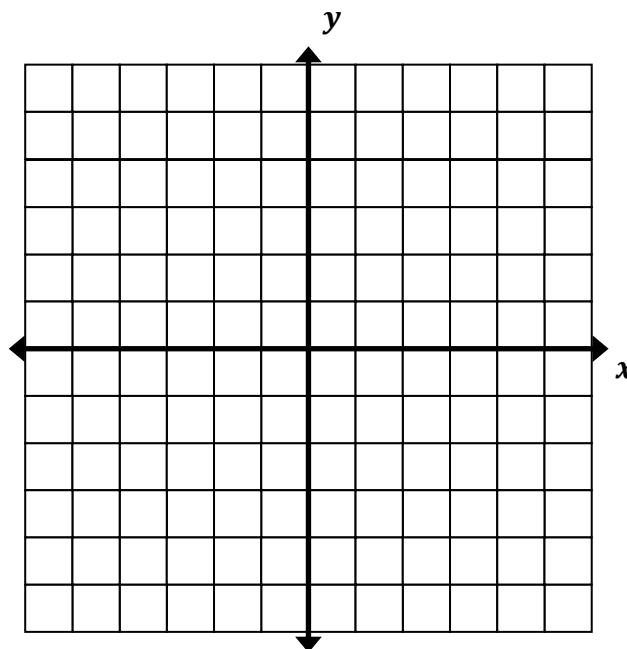
- 1.
2. Table

x	y

3. Graph

4. Domain

Range



Writing Transformed Square-Root Functions

Sample Problem 2: Use the description to write the square root function $g(x)$.

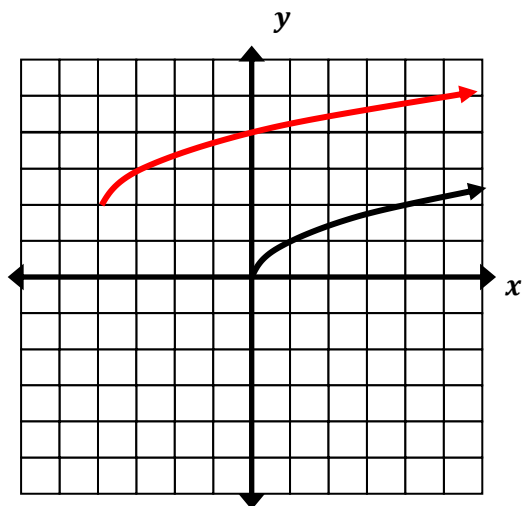
- a. The parent function $f(x) = \sqrt{x}$ is reflected across the x-axis, and translated down 5 units.
- b. The parent function $f(x) = \sqrt{x}$ and translated up 5 units and 3 units left

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Applying Multiple Transformations

Sample Problem 2: Use the graph shown as a guide, write the equation and describe the transformation.

a.



b.

