

Square Root Functions

Review the Square Shape

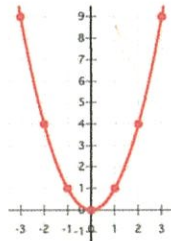
We can use the square shape to remember the square root shape because they have a very similar pattern.

$$y = x^2$$

Do you remember the "parabola pattern?"

It's the vertical increase of 1, 3, 5, ... each time we take a step left or right of the vertex. You see it in the table and in the graph.

x	x ²
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



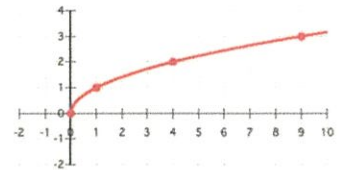
The Basic Square Root Shape

The shape of the basic square root function is literally "half of a parabola on its side."

A table of the key points looks exactly like a table for the square function, with the values of x and y reversed!

$$y = \sqrt{x}$$

x	√x
0	0
1	1
4	2
9	3



The 1, 3, 5, ... pattern is shown in the x-values of the table and horizontal change in the graph.

Square Root Function - Transformation Examples:

<p>Translations</p>	<p>Reflection</p>	<p>Vertical Stretch/Shrink</p>
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Radical Functions are of the form $f(x) = a\sqrt{bx+c} + d$.

To graph a radical function, we will use tables for the most part. The biggest challenge is to find the x-values to pick. You want to find convenient x-values that lie in the domain of the function.

The Domain of $f(x) = a\sqrt{bx+c} + d$ is $bx+c \geq 0$.

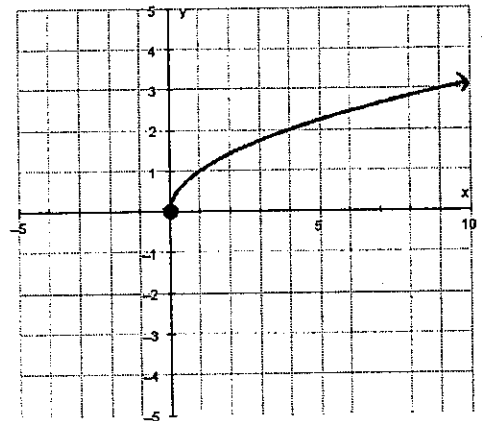
The parent function for a radical equation is $f(x) = \sqrt{x}$.

This parent function can be stretched, shifted and flipped similarly to a quadratic function $f(x) = a(bx+c)^2 + d$.

a : The vertical stretch or flip.

$bx+c$: The horizontal position (stretch or shift).

d : The vertical shift.

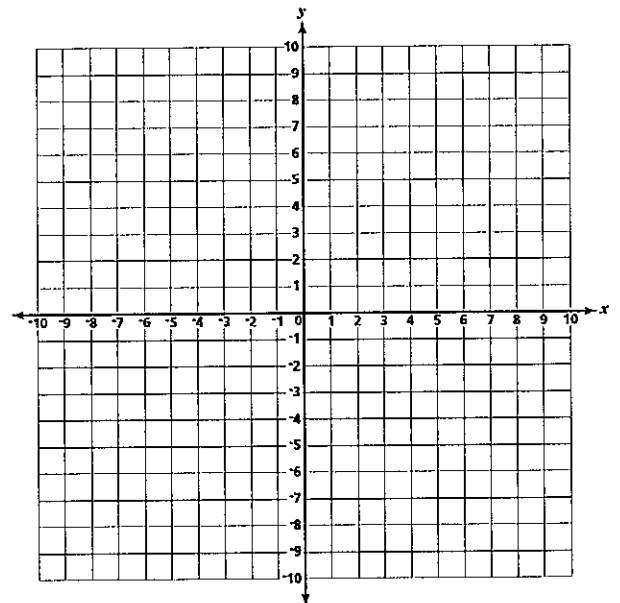


Complete the following tables and graph each function.

1) $f(x) = 3\sqrt{x}$

Domain: $x \geq 0$

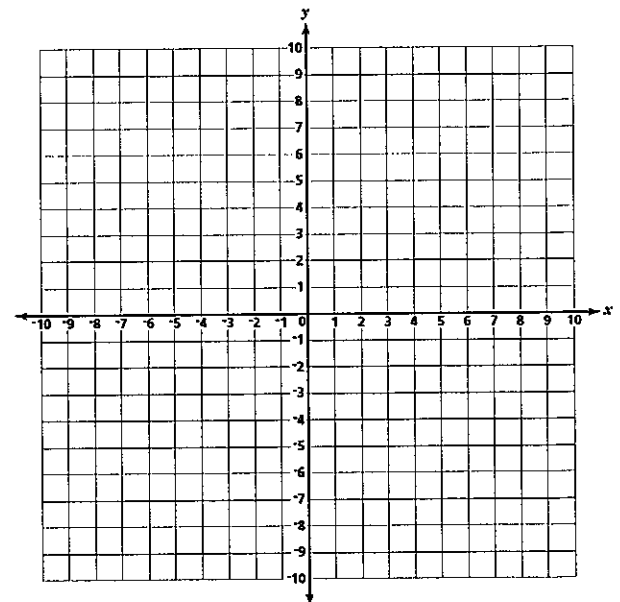
x	$3\sqrt{x}$	y



2) $f(x) = -\sqrt{x}$

Domain: $x \geq 0$

x	$-\sqrt{x}$	y

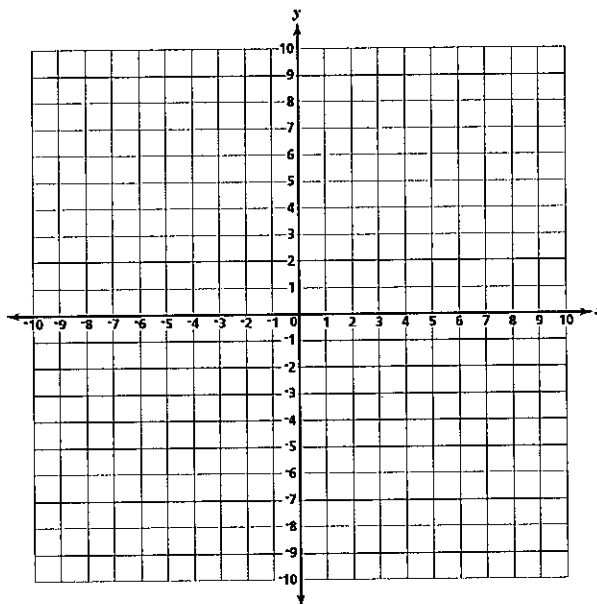


3) $f(x) = \sqrt{x+3}$

Domain: $x+3 \geq 0$

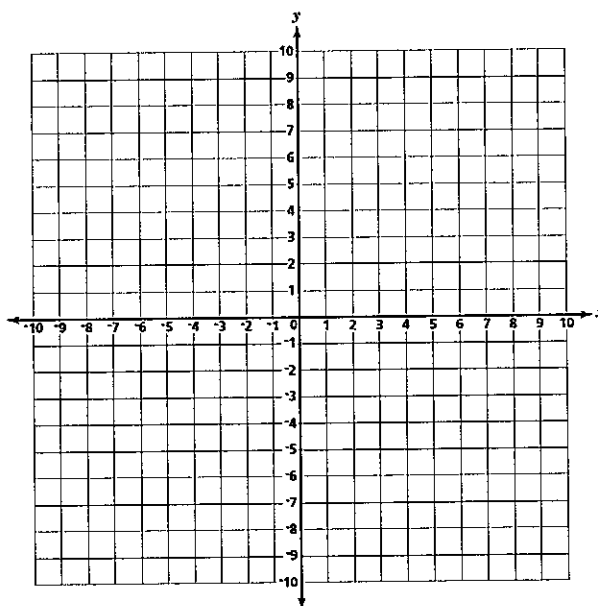
x _____

x	$\sqrt{x+3}$	y



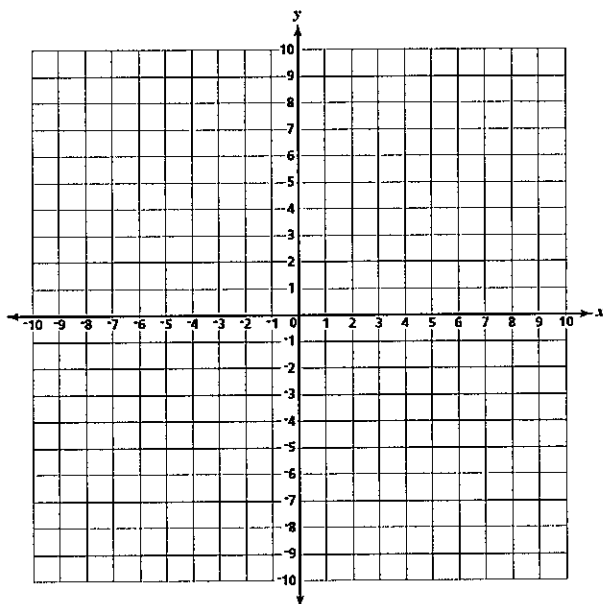
4) $f(x) = \sqrt{x} - 6$

Domain: _____



5) $f(x) = \sqrt{x+2} - 6$

Domain: _____



6) $f(x) = \sqrt{-2x}$

Domain: $-2x \geq 0$

x _____

x	$\sqrt{-2x}$	y
0		
$-\frac{1}{2}$		
-2		
$-\frac{9}{2}$		

