

10-5 Reteaching

Graphing Square Root Functions

You can find the domain of a square root function by setting the values inside the radicand greater than or equal to zero. The domain tells you the limits of the x -values for a function. Use the domain to then find the range, which is the limit of the y -values. Knowing the domain saves time when developing coordinate pairs to graph for a square root function.

Problem

What are the domain and range of the function $y = 4\sqrt{-x + 6}$?

The domain of a square root function must be greater than or equal to zero because there is no real square root of a negative radicand. Remember that while the radicand must not be negative, the x - and y -values of a function may be either positive or negative.

Solve

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

$$-x + 6 \geq 0$$

$$-x \geq -6$$

$$x \leq 6$$

The radicand must not be negative.

Subtract 6 from both sides to isolate the variable.

Divide both sides by -1 to solve for x . Switch the direction of the inequality sign when you divide by a negative.

Check

x	y
6	0
5	4
2	8
-3	12
-10	16
-19	20

Create a table of values. What values of x will assure you always get a radicand value that is greater than or equal to 0?

Only values less than or equal to 6 will give you x -values that are greater than or equal to 0.

The range indicated by the table includes all y -values that are greater than or equal to 0.

Solution: The domain of the function $y = 4\sqrt{-x + 6}$ is $x \leq 6$ and the range is $y \geq 0$.

Exercises

Find the domain and range of each function.

1. $y = \sqrt{x} + 12$

$D: x \geq 0; R: y \geq 12$

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

$D: x \geq \frac{3}{2}; R: y \geq 0$

3. $y = \sqrt{1.5x + 6}$

$D: x \geq -4; R: y \geq 0$

4. $y = \sqrt{-5x + 1}$

$D: x \leq \frac{1}{5}; R: y \geq 0$

5. $y = \frac{1}{2}\sqrt{x + 2}$

$D: x \geq -2; R: y \geq 0$

6. $y = \sqrt{7(x - 2)}$

$D: x \geq 2; R: y \geq 0$

10-5 **Reteaching** (continued)

Graphing Square Root Functions

The domain and range of a function tell you where to start the graph of a square root function.

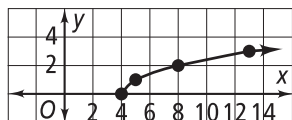
Problem

What is the graph of $y = \sqrt{x - 4}$?

Find the domain and create a table of values. Then plot the coordinate pairs to graph the function.

Solve $y = \sqrt{x - 4}$
 $x \geq 4$

x	y
4	0
5	1
8	2
13	3



Find the domain of the function.

Create a table of values to generate some coordinate pairs.

Notice that choosing values for x that make the radicand a perfect square creates integer coordinate pairs, which will make it easier to graph.

Graph the coordinate pairs from the table.

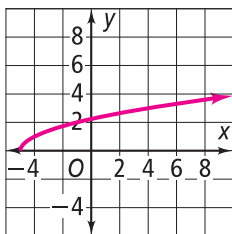
Check Use the rules for transforming a graph to check your graph.

For any positive number h , graphing $y = \sqrt{x - h}$ translates the graph of $y = \sqrt{x}$ to the right h units. For the function $y = \sqrt{x - 4}$, $h = 4$, so the graph of $y = \sqrt{x}$ must move 4 units to the right.

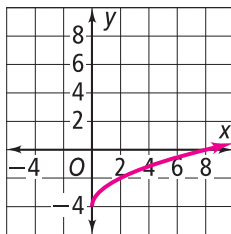
Exercises

Graph each function.

7. $y = \sqrt{x + 5}$



8. $y = \sqrt{2x} - 4$



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

