8-7 Radical Functions

You can explore the behavior of radical functions by using a graphing calculator.

1. Enter the function $f(x) = \sqrt{x}$ by pressing [Y=] and entering $\sqrt{x}$. Graph the function in the standard square window by pressing [ZOOM] and selecting **6:ZStandard** and by pressing [ZOOM] again and selecting **5:ZSquare**. Based on the graph, what is the domain of the function $f(x) = \sqrt{x}$?

2. Why is the function f restricted to this domain?

Graph each of the following functions on a graphing calculator and give its domain.

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

4. $f(x) = \sqrt{x - 5}$

5. $f(x) = \sqrt{x + 4}$

6. $f(x) = \sqrt{x + 1}$

THINK AND DISCUSS

7. **Describe** how the graph of $y = \sqrt{x - h}$ is related to the graph of $y = \sqrt{x}$.

8. **Explain** how you can determine the domain of the function $y = \sqrt{x - h}$.

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$\{x | x \geq 0\}$

2. Why is the function f restricted to this domain?

Graph each of the following functions on a graphing calculator and give its domain.

3. $f(x) = \sqrt{x - 2}$ $\{x | x \geq 2\}$

4. $f(x) = \sqrt{x - 5}$ $\{x | x \geq 5\}$

5. $f(x) = \sqrt{x + 4}$ $\{x | x \geq -4\}$

6. $f(x) = \sqrt{x + 1}$ $\{x | x \geq -1\}$

THINK AND DISCUSS

7. Describe how the graph of $y = \sqrt{x - h}$ is related to the graph of $y = \sqrt{x}$.

8. Explain how you can determine the domain of the function $y = \sqrt{x - h}$.

2. The value of x is restricted to nonnegative numbers because the square root of a negative number is not a real value.

7. The graph of $y = \sqrt{x - h}$ is the graph of $y = \sqrt{x}$ translated h units to the right if $h > 0$ and $|h|$ units to the left if $h < 0$.

8. The expression under the radical must be nonnegative, so the domain is $\{x | x \geq h\}$.

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