6.5 Graph Square Root and Cube Root Functions

TEKS 2A.4.B, 2A.9.A, 2A.9.B, 2A.9.F

Before	You graphed polynomial functions.
Now	You will graph square root and cube root functions.
Why?	So you can graph the speed of a racing car, as in Ex. 38.

Key Vocabulary
- radical function
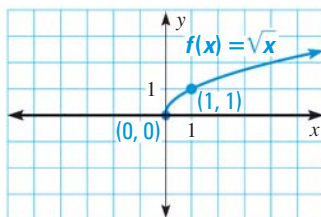- parent function, p. 89

In Lesson 6.4, you saw the graphs of $y = \sqrt{x}$ and $y = \sqrt[3]{x}$. These are examples of **radical functions**. In this lesson, you will learn to graph functions of the form $y = a\sqrt{x - h} + k$ and $y = a\sqrt[3]{x - h} + k$.

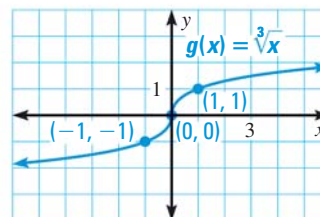---

KEY CONCEPT *For Your Notebook*

Parent Functions for Square Root and Cube Root Functions

The parent function for the family of square root functions is $f(x) = \sqrt{x}$.

Domain: $x \geq 0$, Range: $y \geq 0$

The parent function for the family of cube root functions is $g(x) = \sqrt[3]{x}$.

Domain and range: all real numbers

EXAMPLE 1 Graph a square root function

Graph $y = \frac{1}{2}\sqrt{x}$, and state the domain and range. Compare the graph with the graph of $y = \sqrt{x}$.
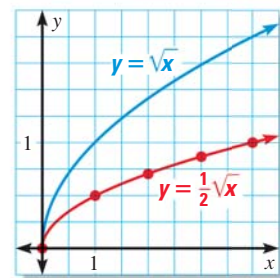
Solution

Make a table of values and sketch the graph.

x	0	1	2	3	4
y	0	0.5	0.71	0.87	1

REVIEW DOMAIN AND RANGE
For help with the domain and range of a function, see p. 72.

The radicand of a square root must be nonnegative. So, the domain is $x \geq 0$. The range is $y \geq 0$.

The graph of $y = \frac{1}{2}\sqrt{x}$ is a vertical shrink of the graph of $y = \sqrt{x}$ by a factor of $\frac{1}{2}$.