11.1 Graph Square Root Functions

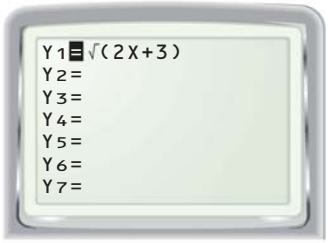
TEKS a.5, A.2.B; 2A.9.C

QUESTION How can you use a graphing calculator to graph square root functions?

EXAMPLE Graph the function $y = \sqrt{2x + 3}$ and describe its domain and range

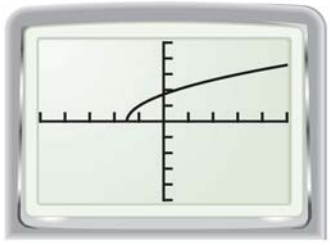
STEP 1 *Enter the function*

Enter the function into a graphing calculator. Use parentheses around the radicand.



STEP 2 *Graph the function*

Graph the function. Adjust the viewing window if necessary.



STEP 3 *Describe the domain and range*

From the graph, you can see that the domain is all real numbers greater than or equal to -1.5, or $x \geq -1.5$. The range is all nonnegative numbers, or $y \geq 0$.

PRACTICE

Graph the function using a graphing calculator. Then describe the domain and range of the function.

1. $y = \sqrt{4x}$ **2.** $y = \sqrt{9x}$ **3.** $y = \sqrt{7x}$

4. $y = -\sqrt{10x}$ **5.** $y = -3\sqrt{x}$ **6.** $y = 1.5\sqrt{3x}$

7. $y = 4.4\sqrt{8x}$ **8.** $y = \sqrt{2x + 8}$ **9.** $y = \sqrt{3x + 4}$

10. $y = -\sqrt{2x - 5}$ **11.** $y = -\sqrt{4x - 6}$ **12.** $y = \frac{1}{2}\sqrt{6 - 5x}$

13. ROLLER COASTER If friction is ignored, the velocity v (in meters per second) of a roller coaster when it reaches the bottom of a hill can be calculated using the formula $v = \sqrt{19.6h}$ where h (in meters) is the height of the hill.

a. Graph the function and describe its domain and range.

b. Use the graph to find the height of a hill if the velocity of the roller coaster at the bottom of the hill is 55 meters per second.