11.3 Solve Radical Equations

Before	You solved linear, quadratic, and exponential equations.
Now	You will solve radical equations.
Why?	So you can use scientific formulas to study animals, as in Ex. 39.

Key Vocabulary
• radical equation
• extraneous solution

An equation that contains a radical expression with a variable in the radicand is a **radical equation.** To solve a radical equation, you need to isolate the radical on one side and then square both sides of the equation.

KEY CONCEPT   *For Your Notebook*

Squaring Both Sides of an Equation

Words If two expressions are equal, then their squares are equal.

Algebra If $a = b$, then $a^2 = b^2$.   **Example** If $\sqrt{x} = 3$, then $(\sqrt{x})^2 = 3^2$.

EXAMPLE 1   Solve a radical equation

Solve $2\sqrt{x} - 8 = 0$.

Solution

$2\sqrt{x} - 8 = 0$	**Write original equation.**
$2\sqrt{x} = 8$	**Add 8 to each side.**
$\sqrt{x} = 4$	**Divide each side by 2.**
$(\sqrt{x})^2 = 4^2$	**Square each side.**
$x = 16$	**Simplify.**

▶ The solution is 16.

CHECK Check the solution by substituting it in the original equation.

$2\sqrt{x} - 8 = 0$	**Write original equation.**
$2\sqrt{16} - 8 \stackrel{?}{=} 0$	**Substitute 16 for *x*.**
$2 \cdot 4 - 8 \stackrel{?}{=} 0$	**Simplify.**
$0 = 0 \checkmark$	**Solution checks.**

✓ **GUIDED PRACTICE**   for Example 1

1. Solve (**a**) $\sqrt{x} - 7 = 0$ and (**b**) $12\sqrt{x} - 3 = 0$.