8.6 Solving Equations with Radicals

Objectives

- Solve radical equations by using the power rule.
- Solve radical equations that require additional steps.
- Solve radical equations with indexes greater than 2.
- Use the power rule to solve a formula for a specified variable.

Power Rule for Solving an Equation with Radicals

If both sides of an equation are raised to the same power, all solutions of the original equation are also solutions of the new equation.

Example 1

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

Solving an Equation with Radicals

- _____. Make sure that one radical term is alone on one side of the equation.
- _____. Raise each side of the equation to a power that is the same as the index of the radical.
- _____the resulting equation. If it still contains a radical, repeat Steps 1 and 2.
- _____ all proposed solutions in the original equation.

Example 2

Solve $\sqrt{3y+1}-4=0.$

Example 3

Solve $\sqrt{5x-1}+3=0.$

Example 4

Solve $\sqrt[4]{2x+5} = 2.$

Example 5

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

Example 6

Solve $\sqrt{x^2 - 3x + 18} = x + 3.$

Example 7

Solve $\sqrt{2x+3}+\sqrt{x+1}=1$.

Example 8

Solve $\sqrt{4x+5} - \sqrt{2x+2} = 1.$

Example 9

Solve $\sqrt[3]{4x-5} = \sqrt[3]{3x+2}$.

Example 10

Solve the formula for R.

$$Z = \sqrt{\frac{R}{T}}$$

Example 11

Solve the formula for a.

$$x = \sqrt{\frac{y+2}{a}}$$