

## 10.6 Radical Equations

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### Solving Radical Equations

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Solving a *radical equation* involves removing the radical from the equation and turning the equation into a form that we can otherwise solve. When doing so, however, we need to be careful of *extraneous solutions* – solutions that we can arrive at algebraically, but are not actually solutions of the original equation. These typically occur when there is a contradiction of some sort during the process.

**Method**

1. Isolate the radical
2. Raise both sides of the equation to the  $n^{\text{th}}$  exponent (removing the radical)
3. Solve the new equation using an appropriate technique
4. Verify possible solutions

**Example 10.6.1.** Solve and verify:

$$\sqrt{3x + 4} = 8$$

**Example 10.6.2.** Solve and verify:

$$\sqrt{x - 1} + 7 = 2$$

**Example 10.6.3.** Solve and verify:

$$\sqrt{6x + 7} - x = 2$$

**Example 10.6.4.** Solve and verify:

$$\sqrt{x + 5} - \sqrt{x - 3} = 2$$

**Example 10.6.5.** Solve and verify:

$$(2x - 3)^{1/3} + 3 = 0$$

**Example 10.6.6.** Solve and verify:

$$(9x + 2)^{1/4} - (5x + 18)^{1/4} = 0$$