

Lesson 5 Solving Radical Equations

A **radical equation** is an equation that contains at least one radical with a variable in the radicand. A solution to a radical equation is called the **root** of the equation.

Steps to Solving Radical Equations

1. Isolate the radical with the variable in the radicand
2. Square both sides of the equation (Squaring is the inverse operation of taking the square root)
3. Check your solutions.

Examples

Solve each equation.

1. $\sqrt{2x} = 4$

$$(\sqrt{2x})^2 = 4^2$$

$$2x = 16$$

$$x = 8$$

check

$$x = 8$$

$$\sqrt{2(8)} = 4$$

$$\sqrt{16} = 4$$

$$4 = 4 \checkmark$$

square both sides

2. $3\sqrt{x} = 4$

$$(3\sqrt{x})^2 = 4^2$$

$$9x = 16$$

$$x = \frac{16}{9}$$

check

$$3\sqrt{\frac{16}{9}} = 4$$

$$3\left(\frac{4}{3}\right) = 4$$

$$4 = 4 \checkmark$$

3. $2\sqrt{x+1} - 7 = 13$

$2\sqrt{x+1} = 20$

$\sqrt{x+1} = 10$

$(\sqrt{x+1})^2 = 10^2$

$x+1 = 100$

$x = 99$

isolate the radical
square both sides

check

$2\sqrt{99+1} - 7 = 13$

$2\sqrt{100} - 7 = 13$

$2(10) - 7 = 13$

$13 = 13 \checkmark$

4. $4\sqrt{x} + 3 = 5\sqrt{x} + 1$

$2 = \sqrt{x}$

$4 = x$

combine like terms

check

$4\sqrt{4} + 3 = 5\sqrt{4} + 1$

$4(2) + 3 = 5(2) + 1$

$11 = 11 \checkmark$

Assignment: Pg. 145 #4, 5, 6a, c, e, 7b, d, f, 9a, b