

**B.4 Solving Square Root and other Radical Equations~****Day 1**

**Objective** To solve square root and other radical equations

**Essential Understanding** Solving a square root equation may require that you square each side of the equation. This can introduce extraneous solutions.

To solve a radical equation, isolate the radical on one side of the equation. Then raise each side to the power suggested by the index.

Ex. Solve for x.

$$(\sqrt{x})^2 = (5)^2$$

$$x = 25$$

$$\frac{3\sqrt{x}}{3} = \frac{21}{3}$$

$$(\sqrt{x})^2 = (7)^2$$

$$x = 49$$

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**Problem 1 Solving a Square Root Equation**

Solve each equation.

**STEPS:**

- 1. Isolate the radical.
- 2. Raise each side to the power indicated by the index.
- 3. Solve for the variable.

$$\left(\sqrt{\frac{x}{5}}\right)^2 = (3)^2$$

$$5 \cdot \frac{x}{5} = 9 \cdot 5$$

$$x = 45$$

$$\frac{10}{-8} = \frac{\sqrt{n+9}}{-8} + \frac{8}{-8}$$

$$(2)^2 = (\sqrt{n+9})^2$$

$$\frac{4}{-9} = \frac{n+9}{-9}$$

$$n = -5$$

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**Problem 1 Solving a Square Root Equation**

Solve each equation.

**STEPS:**

- 1. Isolate the radical.
- 2. Raise each side to the power indicated by the index.
- 3. Solve for the variable.

$$\begin{array}{r} -6 + \sqrt{\frac{x}{3}} = -2 \\ \underline{+6} \qquad \qquad \underline{+6} \end{array}$$

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

$$3 \cdot \frac{x}{3} = 16 \cdot 3$$

$$\boxed{x=48}$$

$$\frac{2\sqrt[3]{x+4}}{2} = \frac{6}{2}$$

$$\left(\sqrt[3]{x+4}\right)^3 = (3)^3$$

$$\begin{array}{r} x+4 = 27 \\ \underline{-4} \qquad \underline{-4} \end{array}$$

$$\boxed{x=23}$$

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**Problem 1 Solving a Square Root Equation**

Solve each equation.

**STEPS:**

- 1. Isolate the radical.
- 2. Raise each side to the power indicated by the index.
- 3. Solve for the variable.

$$\begin{array}{r} 5 + 2\sqrt[3]{x-1} = 17 \\ \underline{-5} \qquad \qquad \underline{-5} \end{array}$$

$$\frac{2\sqrt[3]{x-1}}{2} = \frac{12}{2}$$

$$\left(\sqrt[3]{x-1}\right)^3 = (6)^3$$

$$x-1 = 216$$

$$\boxed{x=217}$$

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