

# Algebra 1

Chapter 10

Section 10-4

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## Radical Equations

$$\sqrt{2-x} + 7 = 11$$

$$\cancel{(\sqrt{2-x})^2} = \overset{-7}{(4)}^{\overset{-7}{2}}$$

$$\overset{-2}{2-x} = \overset{-2}{16}$$

$$-x = 14$$

$$x = -14$$

Steps:

Isolate Radical

Cancel Radical  
(with exponent 2)

Solve for x

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## Solving Radical Equations

$$\begin{aligned}\sqrt{x} - 4 &= 3 \\ &\quad +4 \quad +4 \\ (\sqrt{x})^2 &= (7)^2 \\ x &= 49\end{aligned}$$

$$\begin{aligned}(\sqrt{x-9})^2 &= (6)^2 \\ x-9 &= 36 \\ &\quad +9 \quad +9 \\ x &= 45\end{aligned}$$

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## Solving Radical Equations

Always check your solutions!

$$\begin{aligned}(\sqrt{x^2+4})^2 &= (\sqrt{5x})^2 \\ x^2+4 &= 5x \\ &\quad -5x \quad -5x \\ x^2-5x+4 &= 0 \\ (x-4)(x-1) &= 0 \\ x-4=0 &\quad x-1=0 \\ x=4 &\quad x=1\end{aligned}$$

$$\begin{aligned}(\sqrt{5x+15})^2 &= (\sqrt{30x-10})^2 \\ 5x+15 &= 30x-10 \\ &\quad -5x \quad -5x \\ 15 &= 25x-10 \\ +10 &\quad +10 \\ 25 &= 25x \\ 1 &= x\end{aligned}$$

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## Solving Radical Equations:

Always check your solutions!

$$\sqrt{x} + 6 = 4$$

$$\quad \quad \quad -6 \quad -6$$

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

~~$$x = 4$$~~

$$\sqrt{4} + 6 \neq 4$$

NO

Solution

$$(20)^2 = (\sqrt{x+1})^2$$

$$400 = x + 1$$

$$\quad \quad \quad -1 \quad \quad \quad -1$$

$$399 = x$$

$$20 = \sqrt{399+1}$$

$$(\sqrt{4s})^2 = (3\sqrt{s-5})^2$$

$$4s = 9(s-5)$$

$$4s = 9s - 45$$

$$-9s = -9s$$

$$\frac{-5s}{-5} = \frac{-45}{-5}$$

$$s = 9$$

$$\sqrt{4 \cdot 9} = 3\sqrt{9-5}$$

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