

## Solve Radical Equations

Solve each radical equation. Be sure to check your solutions.

a)  $\sqrt{x} + \sqrt{x + 3} = 3$

b)  $\sqrt{2x + 15} = x + 6$

c)  $\sqrt{2x - 5} - \sqrt{x + 6} = 0$

d)  $\sqrt{2x - 5} - \sqrt{x + 6} = 2$

## Solve Radical Equations

Solve each radical equation. Be sure to check your solutions.

a)  $\sqrt{x} + \sqrt{x+3} = 3$

$$\begin{aligned}\sqrt{x+3} &= 3 - \sqrt{x} \\ (\sqrt{x+3})^2 &= (3 - \sqrt{x})^2 \\ x+3 &= 9 - 6\sqrt{x} + x \\ 1 &= \sqrt{x} \\ 1 &= x\end{aligned}$$

**Check:**

$$\sqrt{1} + \sqrt{1+3} = 1 + 2 = 3$$

So the solution is **1**.

b)  $\sqrt{2x+15} = x+6$

$$\begin{aligned}2x+15 &= x^2+12x+36 \\ 0 &= x^2+10x+21 \\ 0 &= (x+3)(x+7)\end{aligned}$$

The solutions are  $-3$  and  $-7$ .

Check  $x = -3$ :

$$\sqrt{2(-3)+15} = \sqrt{9} = 3$$

$$-3 + 6 = 3$$

$-3$  is a valid solution.

Check  $x = -7$ :

$$\sqrt{2(-7)+15} = \sqrt{1} = 1$$

$$-7 + 6 = -1$$

$-7$  is an extraneous solution.

The only valid solution is  $-3$ .

c)  $\sqrt{2x-5} - \sqrt{x+6} = 0$

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d)  $\sqrt{2x-5} - \sqrt{x+6} = 2$

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