

Solve Radical Equations

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

a) $6 = x + \sqrt{x}$

b) $3x = 1 + 2\sqrt{x}$

c) $3 = 4\sqrt{x} - x$

d) $\sqrt{x + 5} = x - 1$

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a) $6 = x + \sqrt{x}$

$$\begin{aligned}(6 - x)^2 &= \sqrt{x}^2 \\ 36 - 12x + x^2 &= x \\ x^2 - 13x + 36 &= 0 \\ (x - 9)(x - 4) &= 0\end{aligned}$$

b) $3x = 1 + 2\sqrt{x}$

The only solution is 1.

Note that $\frac{1}{9}$ is an extraneous solution.

c) $3 = 4\sqrt{x} - x$

The two solutions are 9 and 1.

d) $\sqrt{x + 5} = x - 1$

The only solution is 4.

Note that -1 is an extraneous solution.