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

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

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.