15.3 – Solving Equations with Square Roots

Steps for solving a radical equation:

1. Isolate the radical term.
2. Square both sides.
3. Solve for x.
4. Write the solution.

Examples:

1. $\sqrt{7x-18} = 5$ solution: $x = \frac{43}{7}$

$(\sqrt{7x-18})^2 = (5)^2$

$7x - 18 = 25$

$7x = 43$

$x = \frac{43}{7}$

2. $\sqrt{3x-8} + 1 = 3$ solution: $x = 4$

$\sqrt{3x-8} = 2$

$(\sqrt{3x-8})^2 = (2)^2$

$3x - 8 = 4$

$3x = 12$

$x = 4$

3. $7 + 4\sqrt{x} = 3$ solution: $x = 1$

$4\sqrt{x} = -4$

$\sqrt{x} = -1$

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

$x = 1$

4. $5 + \sqrt{x+7} = 2$ solution: $x = 2$

$\sqrt{x+7} = -3$

$(\sqrt{x+7})^2 = (-3)^2$

$x + 7 = 9$

$x = 2$

5. $3\sqrt{x+1} = 3$ solution: $x = 0$

$\sqrt{x+1} = 1$

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

$x + 1 = 1$

$x = 0$