

Irrational equations or **radical equations** have the unknown value under the radical.

To solve an irrational equation, we follow these steps:

1. Isolate a radical in one of the two members and pass it to another member of the other terms which are also radical.
2. Square both members.
3. Solve the equation obtained.
4. Check if the solutions obtained verify the initial equation.

Example $\sqrt{2x-3} - x = -1$

1. Isolate the radical: $\sqrt{2x-3} = -1 + x$

2. Square both members: $(\sqrt{2x-3})^2 = (-1+x)^2$

3. Solve the equation: $2x-3 = 1-2x+x^2$
 $x^2-4x+4 = 0$

$$x = \frac{4 \pm \sqrt{16-16}}{2} = \frac{4}{2} = 2$$

4. Verify: $\sqrt{2 \cdot 2 - 3} - 2 = -1$ $1 - 2 = -1$

The equation has the solution **x = 2**.

57) Solve:

a) $\sqrt{3x+10} - 2x = -5$

b) $\sqrt{x+11} - x = 1$

c) $\sqrt{16-x} + 4 = 8$

d) $\sqrt{12-2x} - 2x = -6$