

Remedial Mathematics

- * Partial Fraction
- * Logarithm
- * Characteristics and Mantissa
- * Matrix
- * Integration
- * Differentiation

Quadratic Equation Examples

Standard Form

$$ax^2 + bx + c$$

where, $a, b, c \neq 0$

Shreedhara Charya Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

taking +ve

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

taking -ve

$$x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

Find the root of given equation :-

L.H.S \neq R.H.S

$$x^2 - 5x - 14 = 0$$

$$a = 1$$

$$b = (-5)$$

$$c = (-14)$$

formula :-

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times (1) \times (-14)}}{2 \times 1}$$

$$x = \frac{5 \pm \sqrt{25 + 56}}{2}$$

$$x = \frac{5 \pm \sqrt{81}}{2}$$

$$x = \frac{5 \pm 9}{2}$$

$$x = \frac{5+9}{2}$$

$$x = \frac{5-9}{2}$$

$$x = \frac{14}{2} = 7$$

$$x = \frac{-4}{2} = -2$$

$$x^2 - 5x - 14 = 0$$

taking $x = 7$

$$(7)^2 - 5(7) - 14 = 0$$

$$49 - 35 - 14 = 0$$

$$49 - 49 = 0$$

$$0 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

taking $x = (-2)$

$$(-2)^2 - 5(-2) - 14 = 0$$

$$4 + 10 - 14 = 0$$

$$14 - 14 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

② $x^2 = 11x + 28$

$$x^2 - 11x + 28 = 0$$

$$a = 1$$

$$b = (-11)$$

$$c = 28$$

Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(1)(28)}}{2 \times 1}$$

$$x = \frac{11 \pm \sqrt{121 - 112}}{2}$$

$$x = \frac{11 \pm \sqrt{9}}{2}$$

$$x = \frac{11 + 3}{2}, \quad x = \frac{11 - 3}{2}$$

$$x = \frac{14}{2}, \quad x = \frac{8}{2}$$

$$x = 7, \quad x = 4$$

$$x^2 - 11x + 28 = 0$$

taking $x = 7$

$$(7)^2 - 11(7) + 28 = 0$$

$$49 - 77 + 28 = 0$$

$$77 - 77 = 0$$

$$0 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

taking $x = 4$

$$(4)^2 - 11(4) + 28 = 0$$

$$16 - 44 + 28 = 0$$

$$44 - 44 = 0$$

$$0 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

$$3 \quad x^2 - 3x - 10 = 0$$

$$a = 1$$

$$b = (-3)$$

$$c = (-10)$$

Formula -

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-10)}}{2 \times 1}$$

$$x = \frac{3 \pm \sqrt{9 + 40}}{2}$$

$$x = \frac{3 \pm \sqrt{49}}{2}$$

$$x = \frac{3+7}{2}, \quad x = \frac{3-7}{2}$$

$$x = \frac{10}{2} = 5 \quad x = \frac{-4}{2} = -2$$

taking $x = 5$

$$x^2 - 3x - 10 = 0$$

$$(5)^2 - 3 \times 5 - 10 = 0$$

$$25 - 15 - 10 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

taking $x = -2$

$$(-2)^2 - 3(-2) - 10 = 0$$

$$4 + 6 - 10 = 0$$

$$10 - 10 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

4. $x^2 - 18x + 45 = 0$

$$x^2 - 15x - 3x + 45 = 0$$

$$x(x-15) - 3(x-15) = 0$$

$$(x-3)(x-15) = 0$$

$$x-3 = 0, \quad x-15 = 0$$

$$x = 3$$

$$x = 15$$

taking $x = 3$

$$x^2 - 18x + 45 = 0$$

$$(3)^2 - 18(3) + 45 = 0$$

$$9 - 54 + 45 = 0$$

$$54 - 54 = 0$$

$$0 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

faking $x = 15$

$$(15)^2 - 18(15) + 45 = 0$$

$$225 - 270 + 45 = 0$$

$$270 - 270 = 0$$

$$0 = 0$$

$$\text{LHS} = \text{RHS}$$

$$(5) \quad x^2 + 3x + 2x + 6 = 0$$

$$x(x+3) + 2(x+3) = 0$$

$$(x+3)(x+2) = 0$$

$$x+3 = 0, \quad x+2 = 0$$

$$x = (-3), \quad x = (-2)$$

faking $x = (-3)$

$$(-3)^2 + 3(-3) + 2(-3) + 6 = 0$$

$$9 - 9 - 6 + 6 = 0$$

$$0 = 0$$

faking $x = (-2)$

$$(-2)^2 + 3(-2) + 2(-2) + 6 = 0$$

$$4 - 6 - 4 + 6 = 0$$

$$0 = 0$$