

4 Quadratic Equations

Standard form:-

$$ax^2 + bx + c = 0$$

Solve:- (i) By factorisation method

→ By splitting the middle term

→ By Identity
 a^2 - b^2 = $(a+b)(a-b)$

→ By common method
 +

(ii) By completing the square method

(iii) By quadratic formula.

Completing the Square Method

1. Divide the equation by coefficient of x^2
2. Half the coefficient of x ($\times \frac{1}{2}$)
3. Constant term \longrightarrow RHS
4. (Square)² and add both sides.
5. Complete the Square Identity. $\begin{cases} a^2 + 2ab + b^2 = (a+b)^2 \\ a^2 - 2ab + b^2 = (a-b)^2 \end{cases}$

Quadratic Formula

Discriminant $D = b^2 - 4ac$ $ax^2 + bx + c = 0$

Nature of Roots :- $\begin{cases} D > 0, \text{ It has 2 distinct real roots} \\ D = 0, \text{ It has 2 equal real roots} \\ (-ve) D < 0, \text{ It has no real roots.} \end{cases}$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{D}}{2a}$$