📗 MATHS NOTEBOOK — Day 5

Chapter: Quadratic Equations (Board + JEE)

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1. Standard Form

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

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2. Relationship Between Roots & Coefficients

If roots = α, β

$$\alpha + \beta = -\frac{b}{a}$$

$$\alpha\beta = \frac{c}{a}$$

Shortcut:

Quadratic from roots (sum S, product P):

$$x^2 - Sx + P = 0$$

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3. Vertex of a Parabola

For

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

Vertex:

$$x_v = -\frac{b}{2a}$$

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

Shortcut:

Find x first → substitute back.

4. Solving Quadratic Inequalities

Steps:

1. Bring to LHS
2. Factorise
3. Plot root points on number line
4. Choose intervals based on sign of parabola
   - If a > 0 (opens up): <0 between roots
   - If a < 0: <0 outside roots