

Quadratic Equations

Chapter 5: Quadratic Equations · Topic 1

Key Concept

The quadratic formula, $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$, solves any quadratic equation, especially useful when factorisation is difficult.

The discriminant (b^2-4ac) determines the nature of roots - positive gives two real roots, zero gives one repeated root, negative gives no real roots.

Factorisation method solves equations by expressing them as a product of two linear factors set to zero.

Understanding quadratic equations is essential for solving real-life problems involving area, projectile motion, and optimisation.

Quick Revision Notes

- Quadratic formula: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$.
- This solves any quadratic equation.
- Discriminant = b^2-4ac .
- Positive discriminant: two real roots.
- Zero discriminant: one repeated root.
- Negative discriminant: no real roots.
- Factorisation expresses as two linear factors.
- Quadratics solve area, motion, optimisation problems.

Practice Questions

- 1 Solve $x^2-5x+6=0$ using factorisation.
- 2 Solve $2x^2+3x-2=0$ using the quadratic formula.
- 3 Calculate the discriminant for $x^2+4x+4=0$.
- 4 Discuss what the discriminant tells us.
- 5 Solve a real-life problem using a quadratic equation.
- 6 Explain the quadratic formula in your own words.