

Geometrical Meaning of Zeroes

Chapter 2: Polynomials · Topic 1

Key Concept

For a quadratic polynomial (degree 2), the graph is a parabola that can intersect the x-axis at two points (two distinct real zeroes), touch it at exactly one point (one repeated zero, where the parabola's vertex lies exactly on the x-axis), or not touch it at all (no real zeroes, though complex zeroes may exist). This visual, graphical connection between algebra (zeroes) and geometry (graph intersections) is a powerful tool for understanding polynomial behaviour without needing to solve equations algebraically every time.

Quick Revision Notes

- Zeroes of a polynomial are the x-coordinates where its graph crosses the x-axis.
- A linear polynomial's graph (a line) has exactly one zero.
- A quadratic polynomial's graph (a parabola) can have 0, 1, or 2 real zeroes.
- This graphical view connects algebra (finding zeroes) to geometry (graph intersections).

Practice Questions

- 1 How many zeroes can a quadratic polynomial have at most?
- 2 Sketch the general shape of a quadratic polynomial's graph that has two real zeroes.
- 3 Explain what it means graphically if a quadratic polynomial has no real zeroes.