

The Mid-point Theorem

Chapter 8: Quadrilaterals · Topic 2

Key Concept

The converse of this theorem is also true and useful: if a line is drawn through the midpoint of one side of a triangle, parallel to another side, it will bisect the third side as well. This theorem is frequently applied to prove properties of quadrilaterals formed by connecting the midpoints of another quadrilateral's sides (which always forms a parallelogram, regardless of the original quadrilateral's shape), a surprising and elegant geometric result derived directly from repeated application of the Mid-point Theorem.

Quick Revision Notes

- Mid-point Theorem: the segment joining two side-midpoints of a triangle is parallel to and half the third side.
- The converse is also true: a line through one midpoint, parallel to another side, bisects the third side.
- This theorem helps prove that connecting midpoints of any quadrilateral's sides forms a parallelogram.
- The theorem provides shortcuts for solving midpoint-related geometry problems.

Practice Questions

- 1 Verify the mid-point theorem using a triangle with given coordinates.
- 2 Explain the converse of the Mid-point Theorem.
- 3 Describe why connecting midpoints of a quadrilateral's sides always forms a parallelogram.