

Tiling Patterns (Tessellations)

Chapter 14: Constructions and Tilings · Topic 2

Key Concept

For a shape to tessellate on its own, the interior angle must divide evenly into 360° (the total angle around any point) — a square's 90° angle fits exactly 4 times ($4 \times 90^\circ = 360^\circ$), a hexagon's 120° angle fits exactly 3 times ($3 \times 120^\circ = 360^\circ$), but a regular pentagon's 108° angle does not divide evenly into 360° , explaining why pentagons alone cannot tessellate a plane without gaps. Tessellations appear in nature (honeycomb patterns), art (Islamic geometric designs, M.C. Escher's artwork), and practical applications like floor and wall tiling.

Quick Revision Notes

- A tessellation covers a surface completely with shapes, without gaps or overlaps.
- Squares, equilateral triangles, and regular hexagons can each tessellate a plane alone.
- A shape tessellates alone if its interior angle divides evenly into 360° .
- Tessellations appear in nature (honeycombs), art (Escher), and tiling.

Practice Questions

- 1 Create a simple tessellation pattern using squares or triangles.
- 2 Explain why a regular hexagon can tessellate a plane on its own.
- 3 Investigate whether a regular octagon (135° interior angle) can tessellate alone.