

Triangles and polygons

Pearson Edexcel GCSE Mathematics 1MA1 • L026

Foundation and Higher • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose

Derive angle sums and use triangle, quadrilateral and regular-polygon properties to solve problems.

Vocabulary

Polygon: closed straight-sided shape. Regular: all sides and angles equal. Interior: inside angle.

Exterior: turn between a side and the extension of the previous side. Isosceles: two equal sides.

Why the method works

A triangle has angle sum 180° , proved using a parallel through a vertex. A convex n -gon splits from one vertex into $n-2$ triangles, giving $(n-2) \times 180^\circ$. Walking once round a convex polygon turns 360° .

In a regular polygon each exterior angle is $360 \div n$ and the interior is 180 minus that turn.

Method and checking

Decide whether an angle sum or a single regular angle is needed. Use equal sides to identify equal opposite angles. Check regularity before dividing a sum by n .

Common errors and next attempt

If 360° is used for every interior sum, split a pentagon into triangles. If every polygon angle is assumed equal, contrast an irregular quadrilateral. Recheck a regular octagon: exterior 45° , interior 135° .