

Triangles and polygons

Pearson Edexcel GCSE Mathematics 1MA1

L026 • Geometry and measures

60 minute lesson | learner resources

The goal and the evidence

Connect & Check → Share → Present → Apply → Recall & Review

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

Explain, apply and check independently.

Starting-point diagnostic

R1–R3 • Attempt without notes

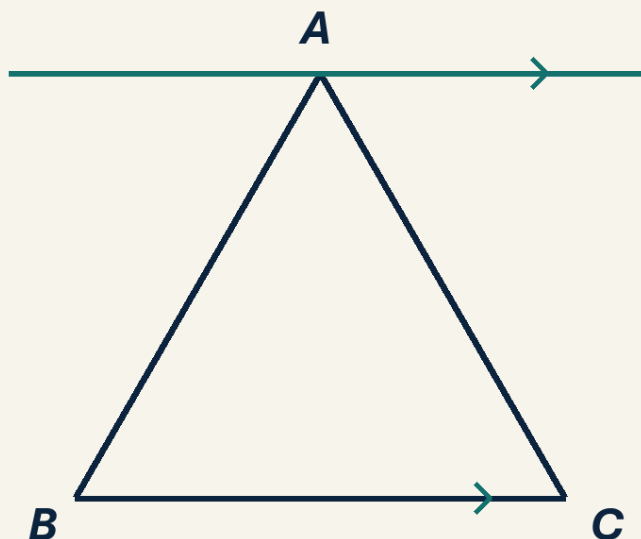
Find the supplement of 65° .

Solve $2x+40=180$.

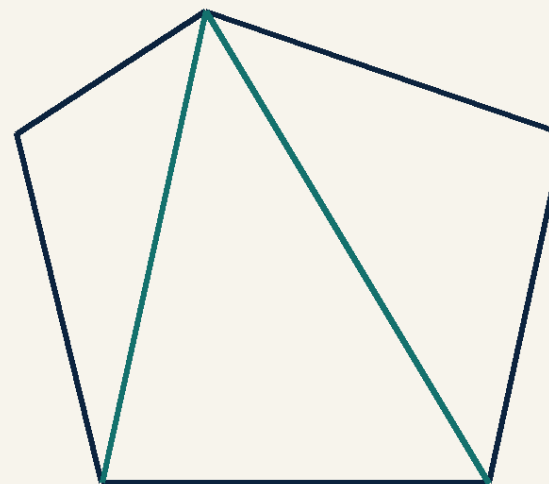
Divide 360 by 8.

See the geometry

Use the diagram and practical sheet.



Teaching sketch • not to scale



Split from one vertex

Worked example and your turn

D1 • Explain each step

Model: triangle angles 45° , 65° , x° give $x=70^\circ$. Now use 38° , 77° , y° .

Try the paired problem; check independently.

Worked example and your turn

D2 • Explain each step

Model: isosceles apex 40° gives base angles 70° .
Now the apex is 56° .

Try the paired problem; check independently.

Worked example and your turn

D3 • Explain each step

Model: a pentagon splits into 3 triangles, sum 540° .
Find the sum for a heptagon.

Try the paired problem; check independently.

Worked example and your turn

D4 • Explain each step

Model: regular octagon exterior 45° , interior 135° .
Find both for a regular decagon.

Try the paired problem; check independently.

A method you can explain

Name the fact or construction at each step.

Check against the original question.

Diagnostic pause

Choose and explain before moving on.

A regular hexagon interior angle is A 60° , B 120° , C 720° .

Use your explanation to decide the next step.

Careful variation

A1 • Show your reasoning

Find interior sums for 4, 5 and 6 sides. Explain the constant increase.

Explain your decisions and check the result.

Independent application

A2 • Show your reasoning

A regular polygon has exterior angle 24° . Find its sides and interior angle.

Explain your decisions and check the result.

Use the method in context

A3 • Show your reasoning

In a parallelogram one angle is 68° . Find the other three and justify.

Explain your decisions and check the result.

Intentional practice feedback

Read after attempting A3

112°, 68°, 112°.

Correct one step and explain the change.

A claim to test

C1 • Show your reasoning

All rhombuses are squares. Disprove the claim using angle properties.

Explain your decisions and check the result.

Deepen the reasoning

C2 • Show your reasoning

Can a regular polygon have exterior angle 50° ?
Explain.

Explain your decisions and check the result.

Retrieval without notes

Q1–Q3 • Numeric answers

Triangle: 35° , 65° , third in degrees

Isosceles apex 32° , base in degrees

Pentagon angle sum, degrees

Retrieval without notes

Q4–Q6 • Numeric answers

Regular hexagon interior, degrees

Regular polygon exterior 20° : sides

Solve $4x=180$

Independent exit evidence

P1 • Without notes • Teacher review

An isosceles triangle has apex angle 74° . Find each base angle with working. [2]

Show working and check your answer.

Independent exit evidence

P2 • Without notes • Teacher review

A regular polygon has interior angle 150° . Find the number of sides. [2]

Show working and check your answer.

Feedback and next steps

P3 • Completion is not mastery

Explain one error you have corrected.

Set a fresh question and a delayed check.

Before the next lesson

L027: Congruence and geometric reasoning

Complete F1 tomorrow without notes.

Attempt F2 and bring one question.

Optional stretch

Find each interior angle of a regular 15-sided polygon.

Show a method. Explain a check or counterexample.

Optional deep challenge

A regular polygon has interior angle 165° . Find its number of sides.

Show a method. Explain a check or counterexample.

L026 Recall & Review

Triangles and polygons

Fresh evidence: prove the objective

Solve a new question without prompts. Explain one check, then correct one error in your working.

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

Write the next practice step before you leave. It must test the method again, not simply copy today's example.

Feedback language

Use the full phrases before the abbreviations.

What Went Well (WWW)

I selected the correct geometric fact, theorem, formula or transformation and used a clear diagram with appropriate labels and units.

Identify the mathematical method, representation, reasoning or check that improved.

Even Better If (EBI)

I will name the fact or theorem, show the substitution or construction step and check whether the size, direction and units of the result are reasonable.

Set one precise next-step action and test it on a fresh question.

Extension route

Choose this route only after the core evidence is secure.

Stretch

Find each interior angle of a regular 15-sided polygon.

Deep challenge

A regular polygon has interior angle 165° . Find its number of sides.

Explain your reasoning clearly enough that another learner could check it.