

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L026

60 minutes • Foundation and Higher • Teacher use only • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

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

L025 angle facts and parallel lines; L019 linear equations.

Selected specification content: G1 G3 G4. These lessons revisit shared content; they do not complete every aspect of those statements.

Preparation and support

Prepare mini-whiteboards, printed fallbacks and a teacher calculator. Prepare rulers, compasses, protractors, tracing paper and the practical drawing sheets. Drawings and constructions require teacher review. Confirm save/export/restore in the intended environment; browser QA remains pending. Distribute only the learner package.

Access: pre-teach vocabulary and read symbols aloud. Scaffold: model the first decision, offer a worked-example or inverse-check frame. Core: remove prompts for A2 and P1–P2. Stretch: C1–C2 deepen reasoning for either tier. Record the support used, not a fixed ability label.

Evidence and pacing

The delivery map totals 60 minutes. Use the recall and hinge to select a repair; the suggested one-third error trigger is a planning judgement, not a validated threshold. If errors are widespread, use two minutes from independent practice and defer C2. P1–P2 need teacher marking. The mini-test and exam practice are delayed/additional activities, not extra tasks squeezed into the hour.

A regular hexagon interior angle is A 60° , B 120° , C 720° . Answer B: 720° is the sum; 60° is the exterior.

Recall and guided-practice answers

R1

115°. Straight-line sum.

R2

$x=70$. Balanced operations.

R3

45. Eight equal turns.

D1

$y=65^\circ$. $180-38-77$.

D2

Base angles 62° each. $(180-56)\div 2$.

D3

900° . $(7-2)\times 180$.

D4

36° exterior; 144° interior. $360\div 10$; $180-36$.

Application and challenge answers

A1

360° , 540° , 720° ; add 180° for one extra triangle. Use $n-2$.

A2

15 sides; 156° . $360 \div 24 = 15$; $180 - 24$.

A3

112° , 68° , 112° . Opposite angles equal; adjacent angles supplementary.

C1

A rhombus with angles $60^\circ, 120^\circ, 60^\circ, 120^\circ$ has equal sides but is not a square. Square also requires right angles.

C2

No; $360 \div 50 = 7.2$ is not a whole number of sides. Regular exterior angles must complete a turn.

Calculator guidance: Optional check after A2: $15 \times 24 = 360$. Angle sums are exact; do not round the number of sides.

Independent evidence and next steps

P1

$(180 - 74) \div 2$ M1; 53° A1. Equal sides face equal angles.

P2

Exterior 30° M1; 12 sides A1. $360 \div 30$.

P3

Individual reflection. Record support and delayed evidence; completion is not mastery.

F1

1260° . 7×180 .

F2

No; second lengths doubled. Same shape does not mean same size.

Retrieval answers: 80, 74, 540, 120, 18, 45. Exact signed decimals/fractions/mixed numbers are accepted; unsupported notation goes to review. No automatic method marks. For rounding, equivalent numerical values may pass retrieval; the teacher checks stated accuracy and required trailing zeros in written work.

Reteaching and release

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° .

Practice feedback is intentionally visible. Full assessment answers, this guide and delivery notes are teacher-only. Local saving is browser dependent; no account service is included. Completed resources enter Review; human approval and outstanding browser checks remain required.

Optional extension activities

Allow 10–15 minutes for learners who have secured the main practice. Show a method, explain a check and justify your conclusion.

Stretch

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

Answer and reasoning: Exterior angle = $360/15 = 24^\circ$, interior = 156° .

Deep challenge

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

Answer and reasoning: Exterior = 15° , sides = $360/15 = 24$.

Ask for a fresh independent explanation before deciding that the method is secure.

Activate Learning lesson cycle

Connect & Check: state the objective and diagnose prior knowledge. Share: pairs predict and compare methods. Present: explain or uncover the model. Apply: fade support for independent practice and optional stretch. Recall & Review: use a fresh question and feedback to decide the next step.

Recall & Review: feedback and extension integration

Lesson L026: Triangles and polygons

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

Timing for a 60-minute lesson

0-7 Connect & Check; 7-14 Share; 14-25 Present/model; 25-44 Apply route choice/practice; 44-52 independent exam-style check; 52-60 Recall & Review, WWW/EBI and next step.

Recall & Review evidence

At the end of the lesson, solve a fresh question without prompts, explain one check, correct one error and record the next practice step.

What Went Well (WWW)

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

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.

Integrated stretch and deep challenge

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.

Teacher use

Use the What Went Well (WWW) and Even Better If (EBI) prompts to write mathematics-specific feedback linked to the objective. Do not accept generic praise: identify the method, representation, reasoning or checking step that improved, then set a fresh next-step question.

Assessment evidence to inspect: Check the formative mini-test and independent workbook response against the objective. Use the teacher answers or mark guidance; group errors for reteaching. Optional check after A2: $15 \times 24 = 360$. Angle sums are exact; do not round the number of sides..