

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L027

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Select a valid triangle congruence criterion and use corresponding parts to build a short proof.

L025 parallel-angle reasoning; L026 triangles and quadrilaterals.

Selected specification content: G5 G6. 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.

Two triangles have equal corresponding angles only. Congruent? A always, B not necessarily. Answer B: their sizes may differ.

Recall and guided-practice answers

R1

60° . 180° total.

R2

50° . $180 - 130$.

R3

Opposite angles equal. Use parallel sides.

D1

SSS. All three corresponding sides match.

D2

SAS. The angle lies between the equal sides.

D3

ASA. Two corresponding angles and included side match.

D4

RHS. Both right angles must be given.

Application and challenge answers

A1

SSS; SAS; RHS. Each specifies enough corresponding information.

A2

$AB=CD$ and $BC=DA$, opposite sides of a parallelogram; AC shared; SSS. Correspondence $A \leftrightarrow C$, $B \leftrightarrow D$, $C \leftrightarrow A$.

A3

$AB=AD$, $BC=DC$, AC shared; ABC and ADC congruent by SSS, so matching angles BAC and CAD are equal. Conclude only after proving congruence.

C1

Both have 60° angles but different sizes; AAA does not prove congruence. Equality of angles gives similarity.

C2

Drawings may be inaccurate. Use the three stated/shared equal side pairs and SSS. Give evidence independent of appearance.

Calculator guidance: No calculator is needed. Length totals can be checked, but congruence requires reasons, not numerical output.

Independent evidence and next steps

P1

SSS B1; DEF B1. Middle letters identify vertices B and E.

P2

Right angles plus hypotenuse and a corresponding side identified B1; RHS B1. The right-angle condition is essential.

P3

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

F1

Same angles can occur at different scales. Supply a numerical example.

F2

Same distance from A as from B. It does not mean a fixed distance from both.

Retrieval answers: 3, 90, 65, 16, 14, 60. 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 SAS is claimed with a non-included angle, mark the two sides and the angle between them. If AAA is used, compare 3,4,5 with 6,8,10 triangles. Recheck a proof with a shared side.

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

State a valid congruence test for sides 5, 7, 8 cm in two triangles and explain.

Answer and reasoning: SSS: all three corresponding sides equal.

Deep challenge

Two triangles have equal side lengths 5 and 7 cm and a non-included equal angle. Must they be congruent?

Answer and reasoning: No. SSA is generally insufficient; more than one triangle may fit.

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 L027: Congruence and geometric reasoning

Objective: Select a valid triangle congruence criterion and use corresponding parts to build a short proof.

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: State a valid congruence test for sides 5, 7, 8 cm in two triangles and explain.

Deep challenge: Two triangles have equal side lengths 5 and 7 cm and a non-included equal angle. Must they be congruent?

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. No calculator is needed. Length totals can be checked, but congruence requires reasons, not numerical output..