

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L031

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Interpret three-figure bearings and construct scale drawings with accurate distance and direction.

L025 parallel-angle facts; L014 scales; ruler and protractor skills.

Selected specification content: G15 R1 R2. 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.

Bearing from A to B is 070° . Bearing B to A? A 110° , B 250° , C 290° . Answer B: add 180° .

Recall and guided-practice answers

R1

1000 m. Metric conversion.

R2

6 km. Multiply by two.

R3

245. Half-turn difference.

D1

180° ; 270° . Clockwise from north.

D2

305° . $125+180$.

D3

130° . $310-180$.

D4

4 cm line at 060° from a north arrow. Distance conversion and bearing are separate.

Application and challenge answers

A1

2, 3 and 5 cm. Real distance divided by two.

A2

3.6 km. $7.2 \times 50000 = 360000$ cm = 3.6 km.

A3

About 7.2 km and 056° . Teacher accepts reasonable drawing estimates: 7.0–7.4 km, 054° – 058° for this classroom task.

C1

070° points north-east; its return is south-west at 250° . 290° is north-west, not opposite. A reverse route differs by 180° .

C2

No; uniform scaling preserves angles. Length on first drawing is twice the second. Allow small measuring error.

Calculator guidance: Optional numerical check for A3 only: $\sqrt{6^2 + 4^2}$ is about 7.21 km; this Pythagoras method is taught later. Use drawing as the core method. Numeric retrieval accepts 90 for 090; the teacher checks three-figure bearing notation.

Independent evidence and next steps

P1

065° B1; subtract 180° for opposite direction B1. Require three digits in written work.

P2

$8 \times 25000 = 200000$ cm M1; 2 km A1. 100000 cm per km.

P3

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

F1

215°; 2 km. Half-turn and scale conversion.

F2

(−3,2); 104°. Retrieve transformation and angle facts.

Retrieval answers: 90, 250, 130, 8, 5, 2500. 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 a protractor starts at east, mark north before measuring. If reverse bearing is $360 - b$, use a north-east route and draw its south-west return. If 1:50 000 is read as metres, label both scale lengths in centimetres.

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

A map scale is 1 cm:4 km. Two points are 7.5 cm apart. Find actual distance.

Answer and reasoning: 30 km.

Deep challenge

The bearing of B from A is 065° . Find the bearing of A from B.

Answer and reasoning: 245° .

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 L031: Bearings and scale drawings

Objective: Interpret three-figure bearings and construct scale drawings with accurate distance and direction.

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: A map scale is 1 cm:4 km. Two points are 7.5 cm apart. Find actual distance.

Deep challenge: The bearing of B from A is 065° . Find the bearing of A from B.

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 numerical check for A3 only: $\sqrt{6^2+4^2}$ is about 7.21 km; this Pythagoras method is taught later. Use drawing as the core method. Numeric retrieval accepts 90 for 090; the teacher checks three-figure bearing notation..