

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L030

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Enlarge shapes from a stated centre, including positive fractional factors, and explain how centre and factor determine the image.

L029 coordinates and transformations; L014 scale factors; fractions.

Selected specification content: G7 G11 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.

Centre (1,1), point (3,1), factor 2. Image A (6,2), B (5,1), C (4,1). Answer B: double displacement (2,0), then add centre.

Recall and guided-practice answers

R1

3. Fractional multiplier.

R2

(3,4). Add displacement.

R3

3. Image divided by object.

D1

(9,6). Multiply both coordinates.

D2

(4,3). Same ray, half the distance.

D3

P'(3,5). Displacement (1,2) doubles to (2,4).

D4

$k=1.5$; 6 cm. $9 \div 6 = 1.5$, then 4×1.5 .

Application and challenge answers

A1

(8,4); (4,2); (2,1). Same ray; distances scale.

A2

(2,2),(6,2),(2,4); horizontal side $2 \rightarrow 4$. All displacements double.

A3

P'(1.5,1), Q'(2.5,1), R'(1.5,2). Halve centre-relative displacements.

C1

Enlargement preserves angles; it halves lengths from the centre and side lengths. Shape remains similar.

C2

12 cm; divide 9 by $\frac{3}{4}$. A positive factor below 1 reduces each length. Check $12 \times \frac{3}{4} = 9$.

Calculator guidance: Optional check: for C(1,1), P(2,3), $k=2$, calculate $1+2 \times (2-1)$ and $1+2 \times (3-1)$. Expect 3 and 5. Brackets preserve the displacement calculation.

Independent evidence and next steps

P1

$P-C=(1,2)$, doubled $(2,4)$ M1; $P'(3,5)$ A1. Add centre back.

P2

0.4 B1; 6 cm B1. Use image/object.

P3

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

F1

$(3,4)$. Halve coordinates.

F2

200000 cm; 500 m. 100 cm per metre, 1000 m per km.

Retrieval answers: 6, 3, 2.5, 3, 5, 6. 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 all coordinates are multiplied when the centre is not origin, first mark the displacement from the actual centre. If a half factor is called impossible, compare same ray distances. Recheck $C(1,1)$, $P(3,1)$, $k=2 \rightarrow (5,1)$.

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

Enlarge a rectangle 3 cm by 5 cm by factor 2.5. Find new area.

Answer and reasoning: New sides 7.5 and 12.5 cm; area=93.75 cm².

Deep challenge

An enlargement factor is -2 about the origin. Where does $(3, -4)$ map, and what happens to orientation?

Answer and reasoning: $(-6, 8)$; it lies opposite the centre and lengths double.

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 L030: Enlargement and scale factors

Objective: Enlarge shapes from a stated centre, including positive fractional factors, and explain how centre and factor determine the image.

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: Enlarge a rectangle 3 cm by 5 cm by factor 2.5. Find new area.

Deep challenge: An enlargement factor is -2 about the origin. Where does $(3, -4)$ map, and what happens to orientation?

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: for $C(1,1)$, $P(2,3)$, $k=2$, calculate $1+2\times(2-1)$ and $1+2\times(3-1)$. Expect 3 and 5. Brackets preserve the displacement calculation..