

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L004

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Diagnose a number error, repair the method, and choose an independent check that tests the original calculation.

L001–L003 signed operations, operation order, place value, rounding and estimation. Wider prerequisite screening is ungraded.

Selected specification content: N1 N2 N3 N14 N15. 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. Use a place-value chart or signed-number line as appropriate. 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.

Which best checks $-6 - (-4) = -2$? A $-2 + (-4) = -6$; B $-6 - (-4)$ again; C $-2 + 4 = 2$. A restores the starting value. B may repeat an error; C adds the wrong signed number.

Wider screen is ungraded and takes four minutes. B1: 7; if 6x-like answers appear, revisit substitution before W5. B2: 15 cm^2 ; 16 suggests perimeter/area confusion. Reteach the concept before W9. B3: 5; revisit equal sharing and total divided by count before W12.

Recall and guided-practice answers

R1

−2; 12. Example check: $-2 + (-5) = -7$. Record the first error before checking feedback.

R2

12; 1. First divide 18 by 3; first multiply 3 by −2. Equal-priority operations go left to right.

R3

48; 6.29. Keep the place-value and rounding decisions visible.

D1

−5; inverse check $-5 + (-3) = -8$. The original error treats subtraction as adding the same signed number.

D2

−8; 1. The first error was adding 6 and 2 before multiplying.

D3

The number was made ten times smaller instead of one hundred times larger. Correct original: 36. Fresh answer: 72. Track each digit's place value.

D4

No. It supports the scale; an exact calculation or inverse check is still needed. Different nearby values can all be reasonable.

Application and challenge answers

A1

-3 , checked by $-3 + (-6) = -9$; 4 , checked by $(-8) \times 4 = -32$. Use the original signed number in the inverse check.

A2

18 ; -7 . First steps $24 \div 4 = 6$ and $2 \times (-6) = -12$. Remove the operation-order prompt once the first step is secure.

A3

84 ; 7.39 ; 80 . Track value, mark the decision digit, then estimate separately.

C1

No. Repeating $2 + 3 \times 4$ as $(2 + 3) \times 4$ gives 20 twice; the correct value is 14 . A repeated misconception can reproduce the same error.

C2

Use exact calculation: $19.7 \times 4 = 78.8$ and $19.7 \times 0.2 = 3.94$; sum 82.74 . Estimation cannot distinguish every pair of nearby answers.

Calculator guidance: Core work is non-calculator. After A3, a calculator may confirm $19.7 \times 4.2 = 82.74$. Estimate first: $20 \times 4 = 80$. A display can confirm arithmetic, but does not explain an error or prove understanding.

Independent evidence and next steps

P1

B1 first error: adding 8 and 2 before multiplying; B1 correct answer 2. Teacher reviews explanation and result.

P2

57 B1; $57 \div 100 = 0.57$ B1. The check must return the original decimal.

P3

Individual action plan. Record support used; no grade or mastery label.

F1

−7; 12; 29. Retry without the repair card, then explain one check.

F2

1, 2, 3, 4, 6, 12; 2 and 11 are prime. 1 has only one positive factor, so it is not prime.

Retrieval answers: -3, 21, 8, -2, 73, 4.69. 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

Use R1–R3 to select one priority: R1 signed operations → inverse frame; R2 order → annotate first operation; R3 scale → place-value chart. D1–D3 teach the repairs, then A1–A3 remove prompts. M1–M5 after a delay diagnose retention. Do not set entry tier from this short check. Wider screen findings lead to prerequisite support before the relevant later unit.

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 answers

Stretch

A learner calculates $-7 - (-12) = -19$. Locate the first error and repair it.

Answer and reasoning: Subtracting -12 means add 12, so $-7 + 12 = 5$.

Deep challenge

Create an independent check for $35 \times 0.8 = 28$ that does not simply repeat the multiplication.

Answer and reasoning: $0.8 = 4/5$, and $35 \div 5 \times 4 = 28$; or 80% of 35 = 28.

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 L004: Number diagnostic and repair

Objective: Diagnose a number error, repair the method, and choose an independent check that tests the original calculation.

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 used my working and assessment evidence to identify the exact mathematical step that was secure and the specific misconception that needs attention.

Even Better If (EBI)

I will correct one precise step, explain why the correction works and complete a fresh delayed question without the original scaffold.

Integrated stretch and deep challenge

Stretch: A learner calculates $-7 - (-12) = -19$. Locate the first error and repair it.

Deep challenge: Create an independent check for $35 \times 0.8 = 28$ that does not simply repeat the multiplication.

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: Compare corrected responses with the original diagnostic and a fresh unprompted question. Record the misconception repaired and a delayed check. Non-calculator core; optional calculator check.