

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L001

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and preparation

L001 develops addition/subtraction of signed integers and a decimal transfer, with explanations and inverse checks. N1 ordering; N2 selected signed operations; N3 inverse relationships. It does not complete these specification statements. L002 teaches multiplication, division and operation priority. Prerequisites: whole-number counting, addition/subtraction and place value. Prior GCSE exposure is assumed by the one-year course; diagnose wider gaps separately.

Prepare mini-whiteboards, equal-interval number lines, printed fallbacks and a teacher calculator with a negative-number key. Open the workbook locally or through an approved VLE. Check export/restore before learner use. Avoid collecting identifying data in filenames. Use the teaching deck privately; distribute the learner package only.

Adapt support without changing the goal

Access: explain integer/opposite/inverse, read signs aloud, offer large-print number lines and verbal rehearsal. Scaffold: start/direction/distance prompts and inverse-check frames. Core: remove prompts in A2 and P1–P2. Stretch: C2 requires a general explanation for all integer b , including zero. Support need is temporary and distinct from entry tier.

Evidence and pacing

The delivery map totals 60 minutes. Collect R1–R3 and the diagnostic hinge before removing support. If more than about one third of learners select -7 for $-5 - (-2)$, reteach before continuing; this is a planning trigger, not a validated threshold. Use two minutes from independent practice and defer C2 if needed. Record the adaptation. P1–P2 need teacher marking. Mini-test is delayed follow-up; examination practice is additional consolidation, not added to the 60-minute lesson.

Recall and worked example answers

R1

$-5, -1, 0, 2$ Ascending means least to greatest. A number farther left is smaller.

R2

5; $5 + 3 = 8$ Subtraction and addition undo one another.

R3

-2 , because it is farther right on the number line. A larger digit does not make a negative number greater.

D1

2; start at -4 , move 6 units right. Adding a positive number moves right. Cross zero carefully.

D2

-3 ; 5; left; $-3 + 5 = 2$. Adding a negative number moves left by its distance from zero.

D3

-8 ; $-8 + 5 = -3$. Subtracting a positive number moves left.

D4

5; 2 Subtracting a negative adds its opposite. The inverse check explains why.

Application and challenge answers

A1

(a) 11 (b) -3 (c) -3 (d) 11 The operation and the sign of the second number both matter.

A2

(a) 3 (b) -15 (c) 3; e.g. $3 + (-9) = -6$. Only one feature varies at a time. Explain why (a) and (c) agree.

A3

$-4 + 9 - 3 = 2^{\circ}\text{C}$. Check: $2 + 3 - 9 = -4$. An increase is a positive change; a decrease is a negative change.

C1

For example, $1 - (-2) = 3$, and $3 > 1$. One counterexample disproves “always”. A counterexample must contradict the stated claim, not just give another calculation.

C2

Exactly when $b < 0$. Subtracting a negative adds a positive amount. $b = 0$ leaves a unchanged; $b > 0$ decreases it. Use a general argument and consider zero. This extension is available to either tier.

Hinge: $-5 - (-2) = -3$. Distractor -7 treats it as adding -2 ; 3 drops the starting negative. Follow-up $-6 - (-4) = -2$. Use $x + (-2) = -5$ to make the inverse relationship visible.

Independent evidence and next steps

P1

-4 ; $-4 + (-3) = -7$. Teacher review: 1 for -4 ; 1 for a valid inverse check.

P2

$-2 - 3 + 8 = 3$, so level 3. Teacher review: 1 for a correct full calculation; 1 for level 3.

P3

Personal response: identify the error, correction and a specific retrieval task. Reflection records a plan, not mastery.

F1

3 and 8; e.g. $8 + (-6) = 2$. Retrieve again in one week.

F2

12, 4, 14; multiplication precedes addition. L002 develops multiplication/division signs and order of operations.

Retrieval Q1–Q6: -3 , -5 , -10 , 2, 7, 1.5. One point each. The digital numeric checker accepts decimals, optional plus signs, Unicode minus, simple fractions and mixed numbers. It flags unsupported notation for review; it never automatically awards method marks. The checker compares exact rational values without a rounding tolerance.

Reteaching routes

Ordering error: rebuild a line with zero and unit spacing, compare -1 and -5 , then retest.

Addition direction error: separate the start value from the change. Subtraction-of-negative error: rewrite and verify by adding the original signed subtrahend. Context error: identify each change and retain units. Correct with a fresh problem the next day and one week later. Completion, confidence and one quiz score are not mastery.

Release boundaries

Intentional practice feedback is visible in learner materials. Full formative/examination solutions and these notes are teacher-only. Offline HTML cannot secure embedded practice feedback; formal assessment solutions are absent. Local saves are browser/device dependent; backup export is essential. No account saving or teacher dashboard is claimed. This pack enters Review, pending independent human mathematical and classroom review.

Optional extension answers

Stretch

Calculate $-18+27-35$ and check by grouping in a second way.

Answer and reasoning: -26 ; for example $(-18+27)-35=9-35=-26$.

Deep challenge

A learner claims subtracting a negative always gives a positive answer. Test the claim with a counterexample.

Answer and reasoning: False: $-8-(-3)=-5$, still negative.

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 L001: Signed numbers

Objective: Order integers; signed addition/subtraction; explain and check.

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 an efficient numerical method, showed the key steps clearly and checked the sign, size or accuracy of my answer.

Even Better If (EBI)

I will make the place-value, sign or operation decision explicit and use estimation or an inverse calculation to check a fresh question.

Integrated stretch and deep challenge

Stretch: Calculate $-18+27-35$ and check by grouping in a second way.

Deep challenge: A learner claims subtracting a negative always gives a positive answer. Test the claim with a counterexample.

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. NC core; optional C check.