

Signed numbers

Pearson Edexcel GCSE Mathematics 1MA1 • L001
Foundation and Higher • 60 minutes • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Use this workbook to calculate with signed numbers, explain a method and check your answer. Write on the lines or replace them with typed answers. Work without a calculator unless a task invites a check. Optional prompts support the same learning goal.

Connect & Check

R1

Write these integers in ascending order: 2, -5 , 0, -1 .

R2

Work out $8 - 3$. Write an addition that checks it.

R3

Which is greater, -2 or -7 ? Explain.

Access: integer means whole number, including zero and negative whole numbers. Ascending means least to greatest. Rehearse your explanation aloud before writing.

Share | In pairs, predict the first step for this problem: A negative sign belongs to a number. A subtraction sign tells you an operation. Brackets help you see which number is being subtracted. Read $-3 - (-5)$ as “negative three subtract negative five”. Compare your reasons before using the worked model.

Present through worked examples

A negative sign belongs to a number. A subtraction sign tells you an operation. Brackets help you see which number is being subtracted. Read $-3 - (-5)$ as “negative three subtract negative five”.

D1

Worked example: $-3 + 5 = 2$. Start at -3 and move 5 units right. Check: $2 - 5 = -3$. Now work out $-4 + 6$ and explain the move.

D2

Complete the example: $2 + (-5) = \underline{\quad}$. Start at 2 and move $\underline{\quad}$ units $\underline{\quad}$. Check by adding 5.

D3

Worked example: $-2 - 4 = -2 + (-4) = -6$. Now work out $-3 - 5$ and check using addition.

D4

Worked example: $-2 - (-4) = -2 + 4 = 2$. Since $2 + (-4) = -2$, subtraction is undone. Complete: $-3 - (-5) = -3 + \underline{\quad} = \underline{\quad}$.

Why subtraction works: $a - b$ is the number which gives a when b is added back. Subtracting b therefore adds its opposite, $-b$. Check the last example by adding -5 back.

Apply with less support

A1

Work out each expression. Compare what changes: (a) $4 + 7$ (b) $4 + (-7)$ (c) $4 - 7$ (d) $4 - (-7)$.

A2

Without the prompts, calculate (a) $-6 + 9$ (b) $-6 - 9$ (c) $-6 - (-9)$. Check one answer by an inverse operation.

A3

A temperature is -4°C . It rises by 9°C , then falls by 3°C . Find the final temperature. Show a calculation and an inverse check.

Optional scaffold: state the start, rewrite subtraction as adding the opposite, calculate, then undo the changes. Try A2 without the prompt. A3 needs $^{\circ}\text{C}$ in the final answer.

Apply and extend reasoning

C1

Sam says “Subtracting always makes a number smaller.” Give a counterexample and explain why it disproves the claim.

C2

For a fixed integer a , when is $a - b$ greater than a ? Explain for any integer b .

Stretch deepens the same goal and is available to either tier. A counterexample is one example that makes an “always” claim false. For C2, explain what happens when b is negative, zero and positive.

Intentional practice feedback for Apply and Challenge

A1: (a) 11 (b) -3 (c) -3 (d) 11

A2: (a) 3 (b) -15 (c) 3; e.g. $3 + (-9) = -6$.

A3: $-4 + 9 - 3 = 2^{\circ}\text{C}$. Check: $2 + 3 - 9 = -4$.

C1: For example, $1 - (-2) = 3$, and $3 > 1$. One counterexample disproves “always”.

C2: Exactly when $b < 0$. Subtracting a negative adds a positive amount. $b = 0$ leaves a unchanged; $b > 0$ decreases it.

Read these after attempting the tasks. Correct one response, then explain your correction. These are practice models, not the solutions to the separate assessments.

Recall & Review through retrieval

Answer without notes. Each correct value earns one retrieval point. A fraction equivalent to the decimal is valid. Total 6 points. A score records this attempt and does not demonstrate mastery.

Q1 $-8 + 5$

Q2 $3 + (-8)$

Q3 $-4 - 6$

Q4 $-4 - (-6)$

Q5 $0 - (-7)$

Q6 $-2.5 + 4$

Intentional retrieval feedback

Q1 -3 ; Q2 -5 ; Q3 -10 ; Q4 2 ; Q5 7 ; Q6 1.5 or $3/2$. Use the opposite operation to check. Cover the key and retry tomorrow; then revisit in one week.

Prove independently and improve

P1 and P2: work without notes for five minutes. Total 4 marks. Teacher review is needed for reasoning and method marks. Show your working. P3 is reflection and has no mark.

P1

Without notes: calculate $-7 - (-3)$, then explain an inverse check.

P2

A lift starts at level -2 , moves down 3 levels, then up 8. Find its final level. Show your method.

P3

Choose one error you corrected. Explain what changed and name a question you will retry tomorrow.

Teacher feedback: _____

My next attempt will be on: _____

Independent success after a delay: teacher to review _____

Prepare for Lesson 2

F1

Tomorrow, without notes, calculate $-5 + 8$ and $2 - (-6)$. Explain one inverse check.

F2

Before L002, calculate 3×4 , $12 \div 3$ and $2 + 3 \times 4$. Write one question about multiplying negative numbers.

Using your digital workbook

The HTML version offers optional prompts, intentional practice feedback, a six-question retrieval check and retry. It saves in your current browser where permitted. Export a JSON backup before moving device, renaming the file or clearing browser data. Restore only a compatible backup. Printing records answers; completion is not mastery.

Record your progress

Prompts attempted: ____ Retrieval: ____ / 6

P1–P2 teacher mark: ____ / 4 Next practice: _____

Which method can I explain without prompts? _____

Optional extension activities

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.

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.

My next-step response
