

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L019

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Solve linear equations while preserving equality. Check solutions in the original equation, including unknowns on both sides.

L017 substitution; L018 expanding single brackets and collecting terms.

Selected specification content: A17. 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 ratio tables, algebra tiles, balance diagrams and number lines 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.

Solve $2x+3=11$. First useful step? A divide only 11 by 2, B subtract 3 from both sides, C add 3 to both sides. Answer B.

Recall and guided-practice answers

R1

5x. Collect like terms.

R2

$2x+6$. Distribute to both terms.

R3

10. Substitution checks a proposed solution.

D1

$x=13$. Add 4 on both sides.

D2

$x=5$. Add 3 then divide by 4.

D3

$x=7$. Divide by 3 then add 2.

D4

$x=5$. Subtract $4x$, add 2, divide by 3.

Application and challenge answers

A1

$x=4$; $x=7$; $x=-4$. Signs and order change the operations.

A2

$x=5$; both sides equal 28. $4x+8=3x+13$.

A3

$3x+7=31$; $x=8$. Subtract 7, then divide by 3.

C1

Dividing by 2 must divide every term: $x+3=7$, so $x=4$. Check $2 \times 4 + 6 = 14$.

C2

First: all real x . Second: none, since 6 cannot equal 7. Simplification can remove the unknown; interpret the remaining statement.

Calculator guidance: Optional check after A2: enter $4 \times (5+2)$ and $3 \times 5 + 13$. Both give 28. Checking does not replace showing the balanced solving steps.

Independent evidence and next steps

P1

$5x=20$ M1; $x=4$ A1. Check $20-4=16$.

P2

$2x=12$ M1; $x=6$ A1. Substitute to obtain 37 on each side.

P3

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

F1

$x=5$; $15+4=19$. Use original equation.

F2

$4n+3$ pounds. The fee is charged once.

Retrieval answers: 7, 6, 7, -4, 4, 21. 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 learners change only one side, annotate the same operation on both sides. If $3(x+2)$ is expanded incorrectly, revisit L018. Recheck $2x+5=13$ and $5x-2=3x+6$.

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

Solve $5(2x-1)=3x+16$ and check.

Answer and reasoning: $10x-5=3x+16$, so $7x=21$, $x=3$; both sides 25.

Deep challenge

Explain why dividing $3x+6=12$ by 3 gives $x+6=4$ incorrectly.

Answer and reasoning: Divide every term: $x+2=4$, so $x=2$.

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 L019: Linear equations

Objective: Solve linear equations while preserving equality. Check solutions in the original equation, including unknowns on both sides.

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 represented the algebraic structure accurately, kept each transformation valid and checked the result by substitution, graph or equivalent reasoning.

Even Better If (EBI)

I will show the missing inverse operation or algebraic step, keep signs and brackets accurate and test the result in the original relationship.

Integrated stretch and deep challenge

Stretch: Solve $5(2x-1)=3x+16$ and check.

Deep challenge: Explain why dividing $3x+6=12$ by 3 gives $x+6=4$ incorrectly.

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. Non-calculator core; optional calculator check.