

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L023

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

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Generate and recognise sequences. Find a linear n th-term rule and use it to decide whether a value belongs.

L017 substitution; L018 expressions; L019 solving linear equations; multiplication facts and squares.

Selected specification content: A23 A24 A25. 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.

For 5,8,11,... which rule? A $5n$, B $3n+2$, C $n+3$. Answer B. $n=1$ gives 5 and the difference is 3.

Recall and guided-practice answers

R1

16,19. Add 3.

R2

14. Substitute position 4.

R3

$n=6$. A positive integer position.

D1

$3n+4$. Add 4 to multiples of 3.

D2

$12-3n$. The difference is -3 ; $n=1$ gives 9.

D3

No: $n=20/3$ is not an integer. A value between positions is not a term.

D4

24,48; 13,21. First multiplies by 2; second adds previous two.

Application and challenge answers

A1

$3n-1$; $3n+2$; $3n+5$. Same difference 3; different vertical adjustment.

A2

3, 19, 79; no, $n=43/4$ is not an integer. Positions must be positive integers.

A3

37 sticks; 10 squares. Each new square shares one side.

C1

No. Many continuation rules can fit a finite list. A linear rule is an intended model unless specified. State the assumed pattern; test its consistency.

C2

25 and 26. The second adds 1 to each square. Differences increase by 2, so neither is linear.

Calculator guidance: Optional check after A2: calculate $4 \times 20 - 1 = 79$ and $(42+1) \div 4 = 10.75$. A non-integer answer does not become a sequence position by rounding.

Independent evidence and next steps

P1

$4n+2$ B1; difference 4 and first term is 2 above 4 B1. Accept equivalent expression.

P2

$n=33/4$ M1; no, not a positive integer A1. Do not round to a position.

P3

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

F1

$4n-1$; 39. Check $n=1$.

F2

Individual question and solution. Teacher checks it targets the same decision with new numbers.

Retrieval answers: 17, 17, 3, 4, 6, 13. 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 the first term is used as the coefficient, compare several differences. If n starts at zero, restate the position convention. If a quadratic pattern is treated as linear, compare differences. Recheck 4,7,10 as $3n+1$.

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

Find n th term of 4, 9, 14, 19, ... and its 25th term.

Answer and reasoning: $5n-1$; 124.

Deep challenge

Can 7, 11, 15, 19, ... contain 100? Justify algebraically.

Answer and reasoning: n th term $4n+3$; $4n+3=100$ gives $n=24.25$, not a whole-number position.

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 L023: Sequences and n th terms

Objective: Generate and recognise sequences. Find a linear n th-term rule and use it to decide whether a value belongs.

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: Find n th term of 4,9,14,19,... and its 25th term.

Deep challenge: Can 7,11,15,19,... contain 100? Justify algebraically.

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.