

Slide by slide delivery map

Pearson Edexcel GCSE Mathematics 1MA1 • L023

25 slides • 60 minutes • Teacher use only • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

01 Sequences and nth terms 1 min Recall

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

02 The goal and the evidence 1 min Recall

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

03 Starting-point diagnostic 5 min Recall

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 $3n+1$.

04 Position, multiples and adjustment 2 min Discover

The middle row is $3n$. Add 2 to each term to obtain 5,8,11,14. Keep the constant difference 3; the first term is not the coefficient.

05 Worked example and your turn 3 min Discover

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

Delivery continued

06 Worked example and your turn 3 min Discover

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

07 Worked example and your turn 3 min Discover

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

08 Worked example and your turn 3 min Discover

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

09 A method you can explain 2 min Discover

Inspect differences and ratios before choosing a pattern. For linear sequences write $dn+c$, use $n=1$ to find c and test more terms. To test membership, solve for n and require a positive integer.

10 Diagnostic pause 3 min Apply

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.

Delivery continued

11 Careful variation 4 min Apply

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

12 Independent application 4 min Apply

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

13 Use the method in context 4 min Apply

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

14 Intentional practice feedback 2 min Apply

Each new square shares one side. 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.

15 A claim to test 4 min Challenge

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.

Delivery continued

16 Deepen the reasoning 4 min Challenge

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

17 Retrieval without notes 4 min Prove

Answers: 17, 17, 3, 4, 6, 13. Completion is not mastery.

18 Independent exit evidence 2 min Prove

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

19 Independent exit evidence 3 min Prove

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

20 Feedback and next steps 2 min Prove

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 $3n+1$.

Delivery continued

21 Before the next lesson 1 min Recall

A checkpoint selects the next teaching step. Try without prompts, identify whether an error concerns units, operations, signs or structure, then practise a new question before rechecking after a delay.

22 From second differences to a rule alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. For 3, 6, 11, 18, 27 the first differences are 3, 5, 7, 9 and second differences are all 2. For a quadratic sequence an^2+bn+c , the constant second difference is $2a$. Thus $a=1$. Subtract n^2 : the remainders are 2, 2, 2, 2, 2. The rule is n^2+2 . Check $n=1$ and $n=4$: 3 and 18. This finds the quadratic rule under a quadratic-pattern assumption; a finite list alone cannot prove a unique continuation.

23 Remove the square term alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. A constant second difference identifies a quadratic-pattern candidate, not the constant term. Halve it to get the n^2 coefficient; then subtract an^2 and find the remaining linear rule. Check every supplied term and the position index, starting at $n=1$.

24 Independent Higher evidence alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. Subtract n^2 to obtain constant remainder 4 M1; n^2+4 A1.

25 Independent Higher evidence alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. $n=2$ gives 6, not 7 (or another valid mismatch) B1; n^2+n+1 B1.

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.