

Sequences and nth terms

Pearson Edexcel GCSE Mathematics 1MA1

L023 • Foundation and Higher

60 minute lesson | learner resources

The goal and the evidence

Connect & Check → Share → Present → Apply → Recall & Review

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

Explain, apply and check independently.

Starting-point diagnostic

R1–R3 • Attempt without notes

Continue 4,7,10,13.

Evaluate $3n+2$ for $n=4$.

Solve $3n+2=20$.

Position, multiples and adjustment

Read the representation; explain the connection.

$n = 1$	$n = 2$	$n = 3$	$n = 4$
3	6	9	12
+ 2	+ 2	+ 2	+ 2
5	8	11	14

Worked example and your turn

D1 • Explain each step

Model: 5, 8, 11, ... compares with 3, 6, 9, ..., so n th term $3n+2$. Find the rule for 7, 10, 13, ...

Try the paired problem; check independently.

Worked example and your turn

D2 • Explain each step

Model: 10, 8, 6, ... has rule $12 - 2n$. Find the rule for 9, 6, 3, 0, ...

Try the paired problem; check independently.

Worked example and your turn

D3 • Explain each step

Model: $3n+2=20$ gives $n=6$, so 20 belongs. Does 22 belong to $3n+2$ for positive integer n ?

Try the paired problem; check independently.

Worked example and your turn

D4 • Explain each step

Model: 2,4,8,16 doubles; 1,1,2,3,5 adds the previous two. Continue 3,6,12,... and 2,3,5,8,... .

Try the paired problem; check independently.

A method you can explain

Name what changes at each step.

Check against the original question.

Diagnostic pause

Choose and explain before moving on.

For 5, 8, 11, ... which rule? A $5n$, B $3n+2$, C $n+3$.

Use your explanation to decide the next step.

Careful variation

A1 • Show your reasoning

Find n th terms for $2, 5, 8, \dots$; $5, 8, 11, \dots$; $8, 11, 14, \dots$.
Explain what stays the same.

Explain your decisions and check the result.

Independent application

A2 • Show your reasoning

For n th term $4n-1$, find terms 1, 5, 20 and decide whether 42 occurs.

Explain your decisions and check the result.

Use the method in context

A3 • Show your reasoning

A row of n joined squares uses $3n+1$ matchsticks.
Find sticks for 12 squares and squares for 31 sticks.

Explain your decisions and check the result.

Intentional practice feedback

Read after attempting A3

37 sticks; 10 squares.

Correct one step and explain the change.

A claim to test

C1 • Show your reasoning

Does a constant first difference prove a displayed finite list continues linearly forever? Explain the assumption.

Explain your decisions and check the result.

Deepen the reasoning

C2 • Show your reasoning

Compare 1,4,9,16,... with 2,5,10,17,... . Give next terms and explain the connection.

Explain your decisions and check the result.

Retrieval without notes

Q1–Q6 • Numeric answers; units as requested

Q1–Q3

Next term: 5, 8, 11, 14

Fifth term of $3n+2$

Coefficient d in

7, 10, 13, ... rule $dn+c$

Q4–Q6

c in the same rule $3n+c$

Position of 20 in $3n+2$

Next term: 2, 3, 5, 8

Independent exit evidence

P1 • Without notes • Teacher review

Find the n th term of 6, 10, 14, ... with first position $n=1$. Explain the adjustment. [2]

Show working and check your answer.

Independent exit evidence

P2 • Without notes • Teacher review

Does 35 occur in $4n+2$ for positive integer n ? Show why. [2]

Show working and check your answer.

Feedback and next steps

P3 • Completion is not mastery

Explain one error you have corrected.

Set a fresh question and a delayed check.

Before the next lesson

L024: Cumulative checkpoint and feedback

Complete F1 tomorrow without notes.

Attempt F2 and bring one question.

From second differences to a rule

Higher alternative • Model • 3 min

3, 6, 11, 18, 27 → second difference 2

Subtract n^2 . Remainder 2 → $n^2 + 2$.

Remove the square term

Higher alternative • H1–H2 • 3 min

Second difference 4 → start with $2n^2$.

Subtract, find the remainder, then check.

Independent Higher evidence

HX1 • 2 marks • 2 min

Find the quadratic rule: 5, 8, 13, 20, 29.

Show how you find the n th term.

Independent Higher evidence

HX2 • 2 marks • 2 min

3, 7, 13, 21, 31: does $n^2 + 2$ work?

Explain and give a matching quadratic rule.

Optional stretch

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

Show a method. Explain a check or counterexample.

Optional deep challenge

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

Show a method. Explain a check or counterexample.

L023 Recall & Review

Sequences and nth terms



Fresh evidence: prove the objective

Solve a new question without prompts. Explain one check, then correct one error in your working.

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

Write the next practice step before you leave. It must test the method again, not simply copy today's example.

Feedback language

Use the full phrases before the abbreviations.

What Went Well (WWW)

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

Identify the mathematical method, representation, reasoning or check that improved.

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.

Set one precise next-step action and test it on a fresh question.

Extension route

Choose this route only after the core evidence is secure.

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.

Explain your reasoning clearly enough that another learner could check it.