

**YEAR 7**

Sequences and Rules

Three sections. Section A is spotting the rule, section B is the n th term in both directions, and section C is the same idea dressed up as a situation. Write an n th term as an expression, not a sentence.

A. Spotting the rule

- 1 Write the next term: 3, 7, 11, 15, 19, ... **23**
- 2 Write the next term: 7, 12, 17, 22, 27, ... **32**
- 3 Write the next term: 100, 92, 84, 76, 68, ... **60**
- 4 Write the next term: 2, 11, 20, 29, 38, ... **47**
- 5 Write the next term: 45, 39, 33, 27, 21, ... **15**
- 6 Write the next term: 12, 19, 26, 33, 40, ... **47**
- 7 What is the term-to-term rule for 5, 8, 11, 14, ...? **add 3**
- 8 What is the term-to-term rule for 80, 73, 66, 59, ...? **subtract 7**

B. The n th term

- 9 The n th term of a sequence is $3n + 1$. Find the 10th term. **31**
- 10 The n th term of a sequence is $4n - 2$. Find the 10th term. **38**
- 11 The n th term of a sequence is $5n$. Find the 10th term. **50**
- 12 The n th term of a sequence is $2n + 7$. Find the 10th term. **27**
- 13 The n th term of a sequence is $10n - 3$. Find the 10th term. **97**
- 14 The n th term is $6n + 2$. Write the first three terms. **8, 14, 20**
- 15 The n th term is $7n - 4$. Write the first three terms. **3, 10, 17**
- 16 Find the n th term of 5, 9, 13, 17, ... **$4n + 1$**
- 17 Find the n th term of 1, 4, 7, 10, ... **$3n - 2$**

- 18 Find the n th term of 8, 13, 18, 23, ... **$5n + 3$**
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C. Rules in use

- 19 A pattern uses 4 sticks for 1 square, 7 sticks for 2 squares and 10 sticks for 3 squares. How many sticks are needed for 5 squares? **16**
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- 20 Using that same pattern, write the n th term for the number of sticks. **$3n + 1$**
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- 21 A taxi charges £3.00 plus £2.00 a mile. What does a 7 mile journey cost?
£17.00
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- 22 Using that same taxi, write a rule for the cost of n miles. **$2n + 3$, in pounds**
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- 23 Sam has £120.00 and spends £8.00 each week. How much is left after 6 weeks?
£72.00
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- 24 Is 3, 6, 12, 24, ... an arithmetic sequence? Explain your answer. **No. Each term is double the one before rather than a fixed amount being added, so there is no common difference.**
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- 25 The n th term of a sequence is $5n + 2$. Explain why 100 cannot be a term in it. **$5n + 2 = 100$ gives $5n = 98$, and 98 is not a multiple of 5, so there is no whole-number position n that lands on 100.**
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