

Sequences

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Find the next 2 terms: 3, 7, 11, 15, ...

Step 1 · Find the common difference: $7 - 3 = 4$

Common difference = +4

Step 2 · Add 4 each time

Next terms: 19, 23

Answer: 19, 23

Check: $15 + 4 = 19$ ✓ $19 + 4 = 23$ ✓

2. Now try one with the steps

Find the nth term of: 5, 8, 11, 14, ...

Step 1 · Find the common difference

Step 2 · nth term = $dn + (a - d)$

Step 3 · Check: $n = 1 \rightarrow 3(1) + 2 = 5$ ✓

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is the next term? 2, 5, 8, 11, ... [1]

2. What is the common difference? 20, 17, 14, 11, ... [1]

3. Find the nth term: 4, 7, 10, 13, ... [2]

4. Find the nth term: 1, 5, 9, 13, ... [2]

5. Find the 20th term of 6, 11, 16, 21, ... [2]

6. Is 85 a term in 3, 8, 13, 18, ...? [3]

7. What is the next term? 50, 44, 38, 32, ... [1]

8. Write the first three terms of the sequence with nth term $2n + 5$. [2]

9. Find the 10th term of the sequence with nth term $7n - 4$. [1]

10. Find the nth term: 10, 8, 6, 4, ... [2]

11. Find the nth term: 3, 9, 15, 21, ... [2]

12. The rule is 'multiply by 3, then subtract 1'. The first term is 2. Write the next three terms. [2]

13. Is 150 a term in the sequence with nth term $4n + 2$? If so, which term? [3]

14. Which term of the sequence $5n - 3$ is the first one greater than 100? [3]

15. Find the nth term: 0.5, 1.25, 2, 2.75, ...

[3]

16. The sequences $3n + 1$ and $5n - 3$ have only one term in common that is less than 20. What is it?

[3]

4. Before you hand it in

nth term of 2, 5, 8, 11, ... written as $3n$ instead of $3n - 1$

The constant is $a - d$, not a . First term is 2, $d = 3$: constant = $2 - 3 = -1$. nth term = $3n - 1$. Check: $3(1) - 1 = 2$ ✓

2, 5, 8, 11 is called geometric because it keeps going up

Arithmetic sequence: add or subtract a fixed amount (common difference). Geometric: multiply or divide by a fixed ratio.

Checking only the first term when verifying an nth term formula

Always check at least 2 or 3 terms. $n = 1, 2$ and 3 costs 20 seconds and catches sign errors.