

Sequences

ANSWERS

Calculator | 30 minutes | Total marks: 30

Name Class

1 Here are the first four terms of a sequence.

5 11 17 23

(a) Write down the next term.

Answer 29 (1) [1 mark]

(b) Work out an expression for the n th term.

goes up in 6s, so $6n$ (1)

Answer $6n - 1$ (1) [2 marks]

2 The n th term of a sequence is $4n + 3$

(a) Work out the first three terms.

Answer 7, 11, 15 (1)(1) [2 marks]

(b) Is 95 a term in this sequence?

You **must** show your working.

$4n + 3 = 95$, so $4n = 92$ (1)

$n = 23$, a whole number, so yes (1)

[2 marks]

3

Here are the first four terms of a sequence.

20 17 14 11

(a) Work out an expression for the n th term.

goes down in 3s, so $-3n$ (1)

Answer $23 - 3n$ (1)

[2 marks]

(b) Work out the first term in the sequence that is negative.

*$23 - 3n < 0$ when n is bigger than 7.67
so the 8th term (1)*

Answer -1 (1)

[2 marks]

4

(a) Write down the next two square numbers.

1 4 9 16

Answer $25, 36$ (1)

[1 mark]

(b) Write down the next two triangular numbers.

1 3 6 10

Answer $15, 21$ (1)

[1 mark]

(c) In this sequence, each term is the sum of the two terms before it.

2 5 7 12 19

Work out the next two terms.

Answer 31 (1), 50 (1)

[2 marks]

5

Here are the first four terms of a geometric sequence.

3 6 12 24

(a) Write down the term to term rule.

Answer *multiply by 2* (1)

[1 mark]

(b) Work out the 8th term.

3×2^7 (1)

Answer 384 (1)

[2 marks]

6

Here are the first five terms of a sequence.

$$a \quad b \quad a + b \quad a + 2b \quad 2a + 3b$$

The 3rd term is 7

The 5th term is 19

Work out the values of a and b .

$$a + b = 7 \text{ and } 2a + 3b = 19 \text{ (1)}$$

$$2(a + b) + b = 19, \text{ so } 14 + b = 19 \text{ (1)}$$

$$a = 2$$

$$b = 5 \text{ (1)}$$

[3 marks]

7

The n th term of a sequence is $n^2 + 3$

Work out the first three terms.

$$\text{Answer } 4, 7, 12 \text{ (1)(1)}$$

[2 marks]

8

Here are the first five terms of a quadratic sequence.

$$3 \quad 9 \quad 19 \quad 33 \quad 51$$

Work out an expression for the n th term.

$$\text{differences } 6, 10, 14, 18$$

$$\text{second difference } 4, \text{ so } 2n^2 \text{ (1)}$$

$$2n^2 \text{ gives } 2, 8, 18, 32, 50, \text{ always } 1 \text{ less (1)}$$

$$\text{Answer } 2n^2 + 1 \text{ (1)}$$

[3 marks]

9

Here are the first five terms of a quadratic sequence.

2 7 14 23 34

Work out an expression for the n th term.

differences 5, 7, 9, 11

second difference 2, so n^2 (1)

take away n^2 to leave 1, 3, 5, 7 (1)

which is $2n - 1$ (1)

Answer $n^2 + 2n - 1$ (1)

[4 marks]

Question	Topic	RAG
1	I can find the n th term of a linear sequence	
2	I can use an n th term to find terms and to test a number	
3	I can work with a decreasing linear sequence	
4	I can continue square, triangular and Fibonacci type sequences	
5	I can work with a geometric sequence	
6	I can use algebra with a Fibonacci type sequence	
7	I can find terms of a quadratic sequence	
8	I can find the n th term of a quadratic sequence	
9	I can find the n th term of a harder quadratic sequence	