

Sequences and Graphs

ANSWERS

Ruler | 30 minutes | Total marks: 26

Name Class

1 Here is a sequence.

7 10 13 16

(a) Work out the n th term.

$$3n \text{ (1)}$$

Answer $3n + 4$ (1) [2 marks]

(b) Work out the 50th term.

Answer 154 (1) [1 mark]

(c) Is 100 a term in this sequence?

You **must** show your working.

$$3n + 4 = 100, \text{ so } n = 32 \text{ (1)}$$

Yes, n is a whole number (1)

[2 marks]

2 Here are the first three patterns in a sequence made from sticks.



Pattern 1



Pattern 2



Pattern 3

The number of sticks in Pattern n is $3n + 1$

Explain how the 3 and the 1 in this rule link to the patterns.

Each new square adds 3 sticks (1)

The first square needs 1 extra stick to close it (1)

[2 marks]

3

- (a) The n th term of a sequence is $n^2 + 2$

Write down the first three terms.

Answer 3, 6, 11 (1)(1)

[2 marks]

- (b) Work out the n th term of this sequence.

2 5 10 17

compare with 1, 4, 9, 16 (1)

Answer $n^2 + 1$ (1)

[2 marks]

- (c) Work out the n th term of this sequence.

3 9 19 33

second difference is 4, so $2n^2$ (1)

2, 8, 18, 32 is 1 less each time (1)

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

[3 marks]

4

Here is a sequence.

3 6 12 24

Write down the next term and the rule for continuing the sequence.

next term 48 (1)

rule multiply by 2 (1)

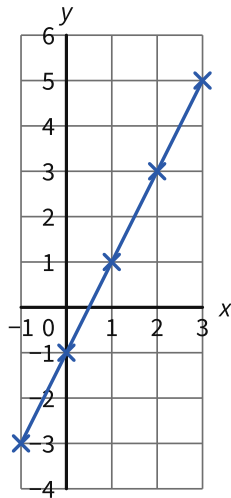
[2 marks]

- 5 (a) Complete the table of values for $y = 2x - 1$

x	-1	0	1	2	3
y	-3	-1	1	3	5 (1)(1)

[2 marks]

- (b) Use your table to draw the graph.



On the grid, draw the graph of $y = 2x - 1$

Points plotted (1) Straight line (1)

[2 marks]

6 $y = 3x + 2$

- (a) Write down the gradient of the line.

Answer 3 (1)

[1 mark]

- (b) Write down where the line crosses the y-axis.

Answer 2 (1)

[1 mark]

- (c) Which one of these lines is parallel to $y = 3x + 2$?

$y = 2x + 3$ $y = 3x - 5$ $y = x + 2$

Answer $y = 3x - 5$ (1)

[1 mark]

- 7 A is the point $(-2, 5)$ and B is the point $(4, -1)$

Work out the coordinates of the midpoint of AB.

$\frac{-2 + 4}{2}$ and $\frac{5 + -1}{2}$ (1)

Answer (1, 2) (1)

[2 marks]

8

A straight line has a gradient of 2 and crosses the y-axis at (0, -3)

Write down the equation of the line.

Answer $y = 2x - 3$ (1)

[1 mark]

Question	Topic	RAG
1	I can find and use the nth term of a sequence	
2	I can explain an nth term using the pattern	
3	I can work with quadratic sequences	
4	I can continue a sequence that multiplies	
5	I can draw a straight line graph from a table	
6	I know what the gradient and intercept are, and can spot parallel lines	
7	I can find a midpoint with negative coordinates	
8	I can write the equation of a line from its gradient and intercept	