

# Special Sequences

For AQA GCSE Mathematics (8300) • Foundation tier

Name \_\_\_\_\_

Total marks: **28**

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Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

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**1** (a) Write down the first five square numbers.

**[1 mark]**

Answer \_\_\_\_\_

(b) Write down the first five triangular numbers.

**[1 mark]**

Answer \_\_\_\_\_

(c) Write down the first four cube numbers.

**[1 mark]**

Answer \_\_\_\_\_

- 2** (a) Circle the geometric progression.

**[1 mark]**

3, 6, 9, 12

3, 6, 12, 24

3, 6, 10, 15

3, 6, 9, 15

- (b) Circle the Fibonacci-type sequence.

**[1 mark]**

2, 5, 8, 11

2, 5, 10, 17

2, 5, 7, 12

2, 5, 10, 20

- (c) Circle the quadratic sequence.

**[1 mark]**

1, 4, 7, 10

2, 6, 18, 54

3, 5, 8, 13

2, 5, 10, 17

- 3** (a) Write the missing term in the geometric progression.

5    20    \_\_\_\_\_    320

**[1 mark]**

- (b) A geometric progression starts    4    16  
Work out the 5th term.

**[2 marks]**

Answer \_\_\_\_\_

- 4** In a Fibonacci-type sequence, each term after the 2nd term is the sum of the two terms before it.  
The 1st term is 7 and the 2nd term is  $-12$   
Work out the 5th term.

**[2 marks]**

Answer \_\_\_\_\_

- 5** A Fibonacci-type sequence is made by adding the previous two terms.  
The 2nd term is 9 and the 4th term is 23  
Work out the 1st term.

**[3 marks]**

Answer \_\_\_\_\_

- 6** Maya says,  
‘50 is a triangular number.’

Is Maya correct? Tick a box.  
Give a reason for your answer.

**[1 mark]**

☐ Yes

☐ No

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- 7** The 1st term of a geometric progression is 5  
The 3rd term is 45  
Every term of the progression is positive.  
Work out the 2nd term.

**[2 marks]**

Answer \_\_\_\_\_

- 8** Work out the next term in each sequence.

- (i) 1   8   27   64   ...  
(ii) 2   3   5   8   13   ...  
(iii) 100   50   25   12.5   ...

**[3 marks]**

- 9** Here are the first four terms of a quadratic sequence.

40   38   34   28   ...

Work out the 6th term.

**[2 marks]**

Answer \_\_\_\_\_

- 10** The first two terms of a Fibonacci-type sequence are  $p$  and  $q$   
Each term after that is the sum of the two terms before it.

Show that the 5th term minus the 2nd term is always equal to twice the 3rd term.

**[2 marks]**

- 11** The first four terms of an arithmetic progression,  $P$ , are

8 14 20 26

The first four terms of a geometric progression,  $Q$ , are

4 8 16 32

Show that 128 is a term of both sequences.

**[4 marks]**