GCSE MATHEMATICS

Higher tier

Algebra

Topic test – Sequences

v1.0

Name _____

Materials

For this paper you must have:
- Mathematical instruments
- A calculator.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 26.

Advice
- In all calculations, show clearly how you work out your answer.

For Teacher's Use	
Pages	Mark
2 - 3	
4 - 5	
6	
TOTAL	

1 Here is a linear sequence.

The first two terms are missing.

… … 5 11 17 23 29 …

1 (a) Describe how the sequence is building up.

[1 mark]

1 (b) What is the first term of the sequence?

[1 mark]

Answer _____

2 The nth term of a sequence is $3n - 1$

2 (a) Work out the first three terms of the sequence.

[1 mark]

Answer _____ , _____ , _____

2 (b) Which term of the sequence has a value of 101?

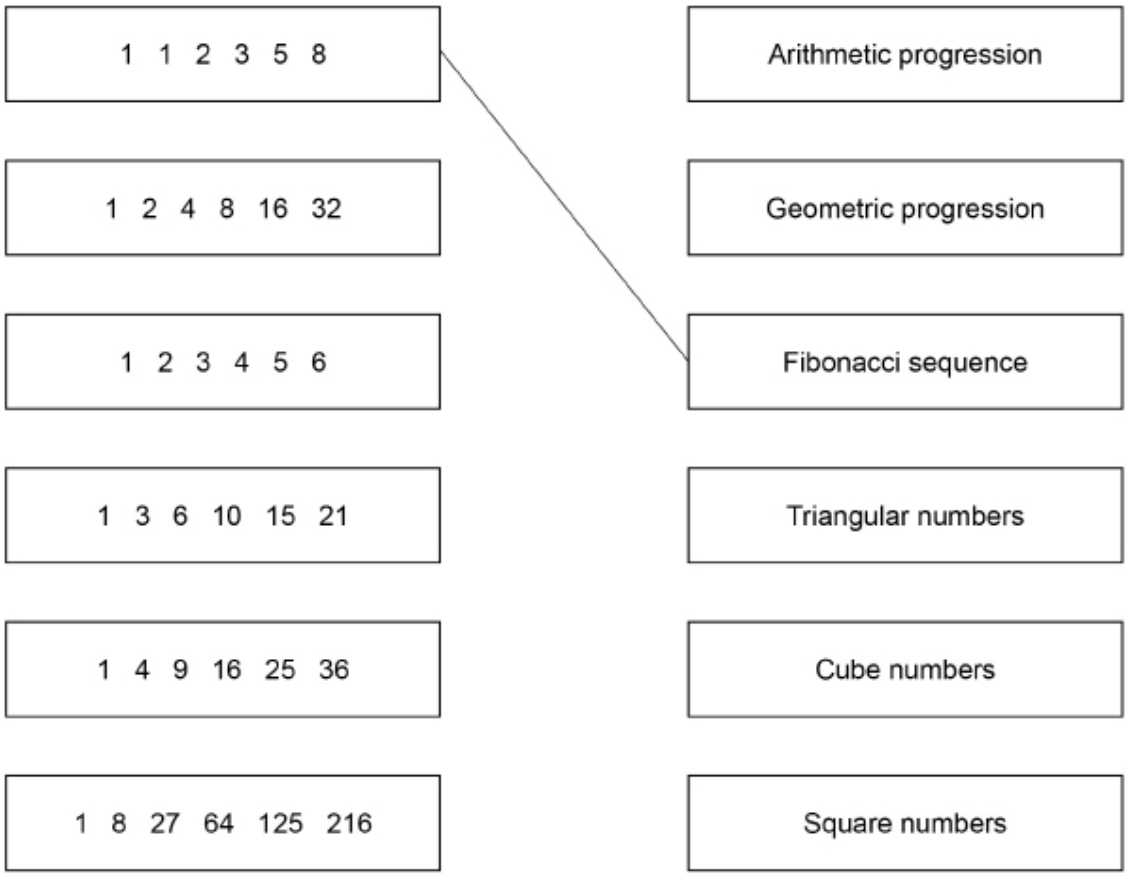
[2 marks]

Answer _____

3 Match each sequence to its description.

One has been done for you.

[4 marks]



4 All the terms of a **geometric** progression are positive.

The second and fourth terms are shown.

… 9 … 81

Work out the first and third terms.

[2 marks]

First term _____

Third term _____

11

5 The nth term of sequence *A* is $2n + 3$

The nth term of sequence *B* is $5n - 4$

Work out **two** different terms that are in both sequences.

[2 marks]

Answer _____

6 The nth term of sequence *P* is $an + b$

The nth term of sequence *Q* is $bn + a$

6 (a) Show that the sequences both start with the same term.

[1 mark]

6 (b) The 2nd term of sequence *P* equals the 3rd term of sequence *Q*.

Show that $a = 2b$

[2 marks]

7 A linear sequence starts:

$a + 6b$ $a + 8b$ $a + 10b$ ....

The 2nd term has value 46
The 5th term has value 82

Work out the values of a and b.

[4 marks]

$a =$ _____

$b =$ _____

8 The nth term of a sequence is $\frac{n(n-4)}{\sqrt{n+3}}$

Work out the sum of the second and third terms.

Write your answer in the form $\frac{a\sqrt{5}+b\sqrt{6}}{c}$ for integers a, b and c

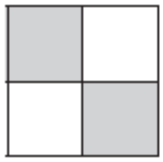
[3 marks]

Answer _____

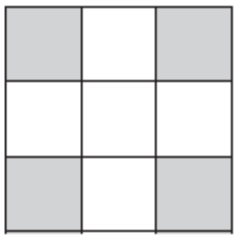
12

9 A square pattern is made from shaded and plain tiles.

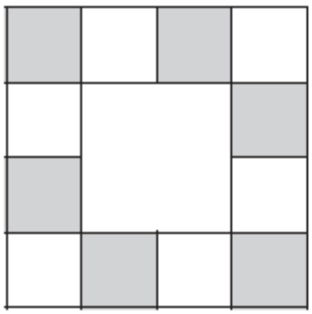
Jon counts how many shaded tiles are in each square pattern.



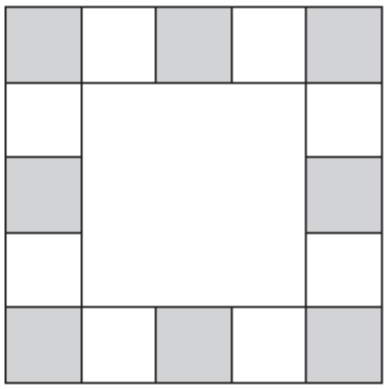
2 shaded tiles



4 shaded tiles



6 shaded tiles



8 shaded tiles

Jon counts 250 shaded tiles around the edges of a square pattern.

How many tiles are along one side of the square?

[3 marks]

Answer _____

END OF QUESTIONS

3