1 (a) A Fibonacci-type sequence starts 3 –8

The sequence is continued by adding the previous two terms.

Work out the next **two** terms.

[2 marks]

Answer _____ and _____

2 The 5th term of a linear sequence is 17

The 6th term of the sequence is 21

Work out the 100th term of the sequence.

[3 marks]

Answer _____

3 A sequence of patterns is made using horizontal sticks and vertical sticks.

Pattern 1 Pattern 2 Pattern 3

The table shows the number of horizontal sticks and vertical sticks in each pattern.

Pattern	Number of horizontal sticks	Number of vertical sticks
1	2	2
2	4	3
3	6	4

What fraction of the total number of sticks in Pattern n are horizontal?

Give your answer in terms of n.

[3 marks]

Answer _____

4 The first three terms of a sequence are $x \quad y \quad xy$

The sequence is continued by multiplying the previous two terms.

4 (a) Circle the 5th term of the sequence.

[1 mark]

x^3y^3 x^5y^5 x^3y^4 x^2y^3

4 (b) The 8th term of the sequence is x^8y^{13}

The value of this term is negative.

What does this mean about the values of x and y ?

Tick **one** box for each row.

[2 marks]

	Must be positive	**Must be negative**	**Could be either**
x			
y			

Turn over for the next question

5 A is an **arithmetic** progression.

Here are the first four terms.

13 16 19 22

G is a **geometric** progression.

Here are the first four terms.

2 4 8 16

nth term of A = 8th term of G

Work out the value of n.

[4 marks]

$n =$ _____

6 Four consecutive triangular numbers are 6 10 15 21

Write down the next triangular number.

[1 mark]

Answer _____

7 The 47th triangular number is 1128

The 48th triangular number is 1176

Work out the 49th triangular number.

[1 mark]

Answer _____

8 The nth terms of two linear sequences, A and B, are added to give the nth term of a new sequence.

The new sequence starts

8 13 18 23

The nth term of sequence A is $n + 1$

Work out the nth term of sequence B.

[4 marks]

Answer _____

9 (a) Here is the rule for a sequence.

After the first two terms, each term is the sum of the previous two terms

The 1st term is 33

The 2nd term is x

The 4th term is 73

Work out the value of x.

[3 marks]

$x =$ _____

9 (b) An expression for the nth term of a different sequence is $n - n^2$

Ruth says,

''All the terms will be negative because n^2 is always greater than n.''

Is she correct?

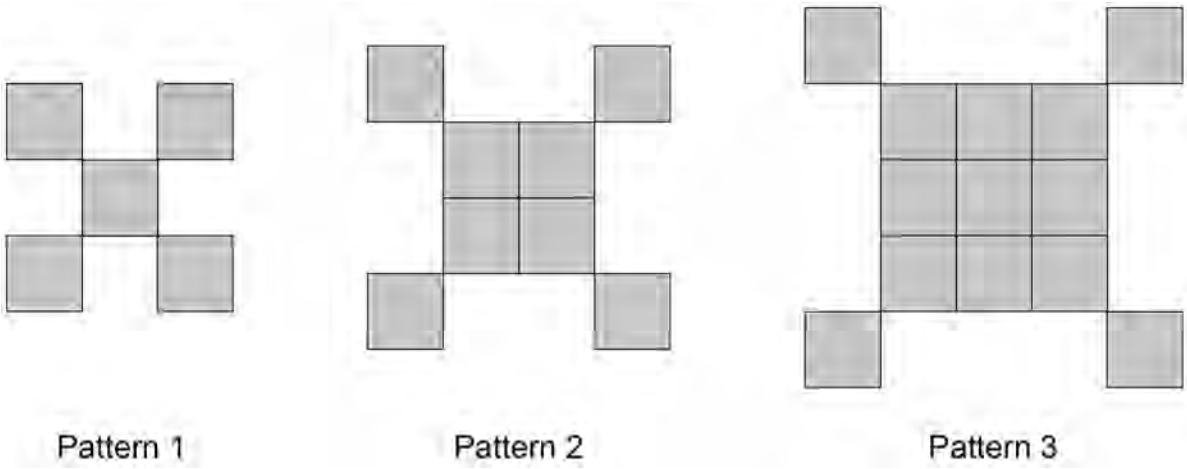
Tick a box.

☐ Yes ☐ No

Give a reason for your answer.

[1 mark]

10 Here are the first three Patterns in a sequence made up of small squares.



Pattern 1 Pattern 2 Pattern 3

10 (a) On the grid, draw Pattern 4

[1 mark]

10 (b) The expression for the number of small squares in Pattern n is $n^2 + 4$

Work out the least value of n for which the number of small squares is greater than 500

[1 mark]

$n =$ _____