Name:_____

GCSE
Series/Sequences

Zack R

1 Instructions

- Use black ink or ball-point pen
- Attempt all questions
- Answer the questions in the spaces provided
- You **must** show all your workings
- Diagrams are **NOT** accurately drawn, unless otherwise indicated
- Calculators may not be used

2 Advice

- Read each question carefully before you start to answer it
- Try to answer every question
- Check your answers if you have time at the end
- The marks for each question are shown in brackets, this will give an indication on the time spent
- Record how long it takes you for each question

3 Information

- The marks for each Question are shown at the bottom
- Use the marks as a guide as to how much time to spend and how much working to show

Question 1: *Here are the first 5 terms of an arithmetic sequence:*

6, 10, 14, 18, 22

Find an expression in terms of n for the n^{th} term of this sequence.

.....

(Total for Question 1 is 2 marks)

Question 2: *The nth term of a sequence is given by:*

4n+23

Is 213 a term in this sequence?

Show explicitly how you got to this conclusion.

.....

(Total for Question 2 is 2 marks)

Question 3: *Here are the first five terms of a number sequence.*

3, 8, 13, 18, 23

a) Write down the next two terms of this sequence

.....

b) Jim says that 50 is a term in this sequence. Jim is wrong.
Explain why.

.....

.....

.....

(Total for Question 3 is 4 marks)

Question 4: Here is a sequence:

19, 13, 7, 1

Write down the 9th term and the 100th term and the difference between them.

Give the term-to-term rule for the sequence

(Total for Question 3 is 4 marks)

Question 5: The nth term of a sequence can be found using,

3n + 8

a) Write the first 5 terms of this sequence

b) Work out the 98th term in this sequence

c) Explain why the number 132 will not occur in this sequence

……

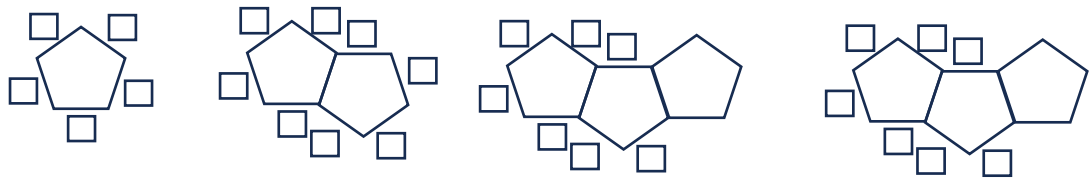
……

(Total for Question 5 is 4 marks)

Question 6:

Each table can fit a maximum of 5 chairs. Once tables are pushed together the chairs where the tables join can no longer be placed

Table 1 | 2 Tables | 3 Tables | 4 Tables



The image shows the layout of different number of tables with chairs.

Complete the table with the correct numbers of chairs and tables for 3 and 4 table arrangements.

6b) Jane's party will require chairs for 250 people.

Each chair costs £9.50 and tables cost £25.

How many tables and chairs will Jane need to use and use this to calculate the total cost.

.....

(Total for Question 6 is 3 marks)

Question 7) Here are some patterns made of dots:

Pattern 1	Pattern 2	Pattern 3
.....	.....	.....
...	.....	.....
.	...	.....
	.	...
		.

a) In the space below, drawn pattern 4

b) Complete the table

Pattern Number	4	5	10	15	1000
Number of dots					

(Total for Question 7 is 5 marks)

Question 8) Write down the next term in the sequence.

3a+5b, a+9b, -a+13b, ……..

8b) If the third term's value is 68 and the fourth term's value is 95 what is the value of a and b?

(Total for Question 8 is 3 marks)

Question 9) The third term of a sequence is -11

The rule for continuing the sequence is multiply by 11 then subtract by 2.

What was the first term of the sequence?

……

b) Here's a rule for a different sequence:

The 5^{th} term is 260

Add 20 then divide by 2

What is the 4^{th} and 2^{nd} term?

2^{nd} term:……..

4^{th} term:……

(Total for Question 9 is 3 marks)

Question 10) Here is a sequence

The rule for finding the next term is to add an integer

9,…… ,45, ……., 81

a) Work out the two missing terms

b) The nth term of another sequence is 3n-19

Which term of the sequence is 104?

……..

(Total for Question 9 is 3 marks)

Question 11) Here are nth terms of 5 sequences

Sequence 1 - 5n+15

Sequence 2 – 2n+3

Sequence 3 – 7n+1

Sequence 4 – 10-60n

For each sequence state whether the numbers in the sequences are:

A - multiple of 5

S - contains only odd numbers

N - contains a mixture of even and odd numbers

Sequence 1 …….

Sequence 2 …….

Sequence 3……..

Sequence 4 …….

(Total for Question 10 is 4 marks)

Question 11) The nth term of a sequence is 4n-13

a) Write down the:

11^{th} 12^{th} and 13^{th} term

……

b) What is the difference between the 70th and 71st terms

……

The last term in the sequence is 1183.

c) How many terms are there in this sequence?

……

(Total for Question 11 is 4 marks)

Question 12) Here are the first 3 terms of a Fibonacci sequence:

5x, 7x, 12x

The difference between the 4th and 6th term of the sequence is 38

a) Work out the value of x

……

The second term of a Fibonacci sequence is 80

The fourth term of the sequence is 253

b) Find the sum of the first, third and fifth terms of the sequence

……

The first term of a Fibonacci sequence is 3a and the third term is x

c) What would be the fifth and seventh terms.

……

(Total for Question 12 is 4 marks)
