

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Algebra

Position-to-term rules for arithmetic sequences

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments



Information

- The marks for questions are shown in brackets

Advice

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

For questions 1 and 14 you must **NOT** use a calculator.



Q1.

The n th term of a sequence is $5n - 2$

Work out the 3rd term.

Circle your answer.

51

5

123

13

(Total 1 mark)

For the rest of the questions, you may use a calculator.



Q2.

A linear sequence begins

2 5 8 11

Work out an expression for the n th term.

(Total 2 marks)

Q3.

The first four terms of a linear sequence are

7 11 15 19

Circle the expression for the n th term.

$n + 6$

$4n + 3$

$7n + 4$

$n + 4$

(Total 1 mark)

Q4.

A linear sequence starts

7 10 13 16

Work out an expression for the n th term of the sequence.

(Total 2 marks)

Q5.

A linear sequence starts

11 21 31 41 ...

Work out an expression for the n th term of the sequence.

(Total 2 marks)

Q6.

The first four terms of a sequence are -10 -8 -6 -4

Circle the expression for the n th term of the sequence.

$-12 - 2n$

$-8 - 2n$

$n + 2$

$2n - 12$

(Total 1 mark)

Q7.

The n th term of a sequence is $19 - 4n$

What is the **smallest** value of n that gives a negative term?

(Total 2 marks)

Q8.

The n th term of a sequence is $12n - 5$
Work out the numbers in the sequence that
have two digits
and
are **not** prime.

(Total 3 marks)

Q9.

Here are some numbers.

10 13 15 20 27 39

10 15 20 is an arithmetic progression.

Use **three** of the numbers to make a different arithmetic progression.

Describe the rule

(Total 2 marks)

Q10(H).

Here is a sequence.

90 82 74 66 58

Circle the expression for the n th term of the sequence.

$$n - 8$$
 $98 - 8n$
$$8n + 82$$
 $8n - 98$

(Total 1 mark)

Q11(H).

The first four terms of a linear sequence are

6 13 20 27

Write down the expression for the n th term.

(Total 1 mark)

Q12(H).

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

The new sequence starts

8

13

18

23

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

Work out the n th term of sequence B.

(Total 4 marks)

Q13(H).

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.

(Total 3 marks)

Position-to-term rules for arithmetic sequences – Cross-topic question

For question 14 you must **NOT** use a calculator.



Q14(H).

A linear sequence starts

$$a + 2b$$

$$a + 6b$$

$$a + 10b$$

.....

.....

The 2nd term has value 8

The 5th term has value 44

Work out the values of a and b .

(Total 4 marks)

For question 15 you may use a calculator.



Q15.

A computer game has five levels.

Each level has a maximum number of points.

These maximum numbers form an **arithmetic progression**.

The table shows the numbers for the first three levels.

Level 1	400
Level 2	750
Level 3	1100
Level 4	
Level 5	

Your score is the **total** of the points you achieve in **each** of the five levels.

Isaac's best score is 1250 points **less** than the highest possible score.

Work out his best score.

(Total 4 marks)