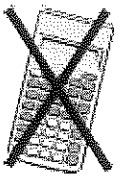
Edexcel GCSE
Mathematics (Linear) – 1MA0

SEQUENCES

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil



Instructions

Use black ink or ball-point pen.
Fill in the boxes at the top of this page with your name, centre number and candidate number.
Answer all questions.
Answer the questions in the spaces provided – there may be more space than you need.
Calculators may be used.

Information

The marks for each question are shown in brackets – use this as a guide as to how much time to spend on **each** question.
Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice

Read each question carefully before you start to answer it.
Keep an eye on the time.
Try to answer every question.
Check your answers if you have time at the end.

1. Here are the first 5 terms of an arithmetic sequence.

5n 5 10 15 20 25

6, 11, 16, 21, 26

+5 +5

Find an expression, in terms of n, for the nth term of the sequence.

5n + 1

(Total 2 marks)

2. Here are the first five terms of a number sequence.

3 8 13 18 23

(a) Write down the next **two** terms of the sequence.

28, 33

(2)

(b) Explain how you found your answer.

Sequence term to term rule is +5

(1)

(c) Explain why 387 is **not** a term of the sequence.

all terms end in 3 or 8

(1)

(Total 4 marks)

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

126 122 118 114 110

−4

(a) Write down the next two terms of the number sequence.

106, 102

(1)

(b) Explain how you found your answer.

term to term rule : −4

(1)

The 20th term of the number sequence is 50

(c) Write down the 21st term of the number sequence.

.....46.....

(1)

(Total 3 marks)

4. Here are the first five terms of a number sequence.

4n: 4 8 12 16 20

3 7 11 15 19

+4 +4

(a) Work out the 8th term of the number sequence.

.....31.....

(1)

(b) Write down an expression, in terms of n, for the nth term of the number sequence.

.....4n - 1.....

(2)

(Total 3 marks)

5. The first five terms of an arithmetic sequence are

7n: 7 14 21 28 35

2 9 16 23 30

+7 +7

Find, in terms of n, an expression for the nth term of this sequence.

.....7n - 5.....

(Total 2 marks)

6. The first five terms of an arithmetic sequence are

5n: 5 10 15 20 25

2 7 12 17 22

+5 +5

Write down, in terms of n, an expression for the nth term of this sequence.

.....5n - 3.....

(Total 2 marks)

7. Here are the first five terms of an arithmetic sequence.

4n: 4 8 12 16 20

−1 3 7 11 15

+4 +4

(a) Find, in terms of n, an expression for the nth term of this sequence.

4n − 5

(2)

In another arithmetic sequence the nth term is $8n - 16$

John says that there is a number that is in both sequences.

(b) Explain why John is wrong.

all numbers in 1st sequence are odd

all numbers in the other sequence are even

(2)

(Total 4 marks)

8. The first four terms of an arithmetic sequence are

−4n −4 −8 −12 −16

21 17 13 9

−4 −4 −4

Find, in terms of n, an expression for the nth term of this sequence.

−4n + 25

(Total 2 marks)

9. The nth term of a sequence is $2n^2$

(i) Find the 4th term of the sequence.

$2(4)^2$

$2(16)$

32

(ii) Is the number 400 a term of the sequence?

No

Give reasons for your answer.

$\frac{400}{2} = 200$, 200 is not a square number

(Total 3 marks)

10. Here are the first 5 terms of an arithmetic sequence.

$6n$: 6 12 18 24 30

3 9 15 21 27

+6 +6

(a) Find an expression, in terms of n, for the nth term of this sequence.

$6n - 3$

(2)

Ben says that 150 is in the sequence.

(b) Is Ben right?

You must explain your answer.

all numbers in the sequence are odd

Ben is therefore incorrect.

(1)

(Total 3 marks)

11. Here are the first 5 terms of an arithmetic sequence.

7 14 21 28 35

2 9 16 23 30

+7 +7

(a) Write down the 12th term of this sequence.

$7(12) - 5$

$84 - 5$

79

(1)

(b) Find, in terms of n, an expression for the nth term of this sequence.

$7n - 5$

$7n - 5$

(2)

(Total 3 marks)

12. The first four terms of an arithmetic sequence are

$-4n$ -4 -8 -12 -16

21 17 13 9

-4 -4 -4

Find, in terms of n, an expression for the nth term of this sequence.

$-4n + 25$

(Total 2 marks)

13. Here are the first 5 terms of an arithmetic sequence.

$5n$: 5 10 15 20 25

6, 11, 16, 21, 26

$+5$ $+5$ $+5$ $+5$

Find an expression, in terms of n, for the nth term of the sequence.

$5n + 1$

(Total 2 marks)

14. The first five terms of an arithmetic sequence are

7 14 21 28 35

2 9 16 23 30

$+7$ $+7$ $+7$

Find, in terms of n, an expression for the nth term of this sequence.

$7n - 5$

(Total 2 marks)

15. Here are the first five terms of a number sequence.

*

3 8 13 18 23
+5 +5

(a) Write down the next **two** terms of the sequence.

28, 33

(2)

(b) Explain how you found your answer.

term to term rule +5

(1)

(c) Explain why 387 is **not** a term of the sequence.

all numbers in the sequence end in 8 or 3

(1)
(Total 4 marks)

16. Here are the first five terms of a number sequence.

4 8 12 16
3 7 11 15 19
+4 +4 +4

(a) Write down an expression, in terms of n, for the nth term of this sequence.

$4n - 1$

(2)

Adeel says that 319 is a term in the number sequence.

(b) Is Adeel correct?
You must justify your answer.

$4n - 1 = 319$

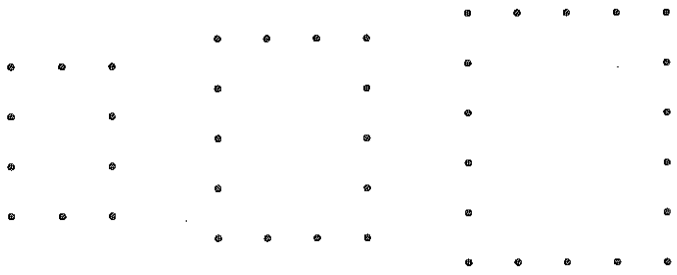
$4n = 320$

$n = 80$

Adeel is correct, it is the 80th term

(2)
(Total 4 marks)

17. Here are some patterns made up of dots.



Pattern number 1 Pattern number 2 Pattern number 3

(a) In the space below, draw Pattern number 4.

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of dots	10	14	18	22	26

+4 +4 +4

(1)

(c) How many dots are used in Pattern number 10?

$26 + (4 \times 5)$

46

(1)

(Total 3 marks)