

## 1MA1 Foundation themed papers: Sequences

Write your name here			
Surname	Other names		
Centre Number		Candidate Number	
Pearson Edexcel Level 1/Level 2 GCSE (9–1)			
<b>Mathematics</b> <b>Sequences</b>			
			Paper Reference <b>1MA1</b>
<b>You must have:</b> Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.			Total Marks

### 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.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.

### Information

- The total mark for this paper is **55**. There are **18** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### 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.

## 1MA1 Foundation themed papers: Sequences

1 Here are the first five terms of a sequence.

1            3            6            10            15

Write down the next two terms of the sequence.

..... , .....

**(Total for Question 1 is 2 marks)**

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2 Here are the first five terms of a sequence.

14    11    8    5    2

(i) Write down the next term of this sequence.

.....

(ii) Explain how you got your answer.

.....

**(Total for Question 2 is 2 marks)**

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

2            5            11            23

The rule to continue this sequence is

multiply the previous term by 2 and then add 1

Work out the 5th term of this sequence.

.....

**(Total for Question 3 is 1 mark)**

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**1MA1 Foundation themed papers: Sequences**

**4** Here are the first 4 terms of a sequence.

2                  9                  16                  23

(a) (i) Write down the next term in the sequence.

.....  
(1)

(ii) Explain how you got your answer.

.....  
.....  
(1)

(b) Work out the 10th term of the sequence.

.....  
(1)

**(Total for Question 4 is 3 marks)**

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**5** Here are the first four terms of an arithmetic sequence.

5                  11                  17                  23

Write down an expression, in terms of  $n$ , for the  $n$ th term of the sequence.

.....  
**(Total for Question 5 is 2 marks)**

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**1MA1 Foundation themed papers: Sequences**

- 6** (a) The  $n$ th term of a sequence is  $3n + 4$

Explain why 21 is not a term of this sequence.

.....  
.....

**(2)**

- (b) Here are the first three terms of a different sequence.

1            2            4

Write down two numbers that could be the 4th term and the 5th term of this sequence.  
Give the rule you have used to get your numbers.

.....  
.....  
.....

**(2)**

**(Total for Question 6 is 4 marks)**

**1MA1 Foundation themed papers: Sequences**

7 Here are the first five numbers in a sequence.

47    41    35    29    23

(a) Find the first negative number in the sequence.

.....  
(2)

Sarah says,

“ $-100$  is **not** a number in this sequence.”

(b) Is Sarah correct?

Explain why.

.....  
.....  
(1)

**(Total for Question 7 is 3 marks)**

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**1MA1 Foundation themed papers: Sequences**

**8** Here are the first five terms of a Fibonacci sequence.

3      3      6      9      15

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

..... , .....  
**(1)**

The first three terms of a different Fibonacci sequence are

$a$        $a$        $2a$

(b) Find the 6th term of this sequence.

.....  
**(2)**



**(Total for Question 8 is 3 marks)**

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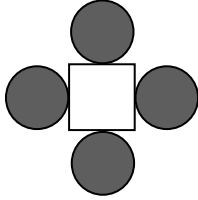
**1MA1 Foundation themed papers: Sequences**



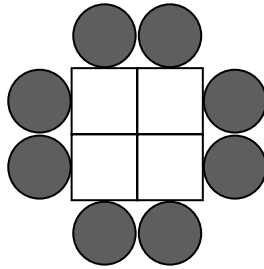
9

A sequence of patterns is made from circular tiles  and square tiles 

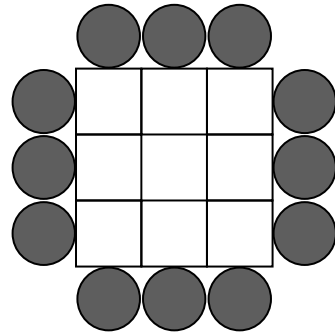
Here are the first three patterns in the sequence.



pattern number 1



pattern number 2



pattern number 3

(a) How many square tiles are needed to make pattern number 6?

.....  
(2)

(b) How many circular tiles are needed to make pattern number 20?

.....  
(2)

Derek says,

“When the pattern number is odd, an odd number of square tiles is needed to make the pattern.”

(c) Is Derek right?

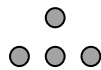
You must give reasons for your answer.

.....  
.....  
(2)

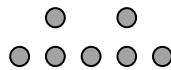
**(Total for Question 9 is 6 marks)**

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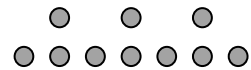
**10** Here is a sequence of patterns made with counters.



pattern number 1



pattern number 2



pattern number 3

(a) Find an expression, in terms of  $n$ , for the number of counters in pattern number  $n$ .

.....  
(2)

Bayo has 90 counters.

(b) Can Bayo make a pattern in this sequence using all 90 of his counters?  
You must show how you get your answer.

(2)

**(Total for Question 10 is 4 marks)**

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**1MA1 Foundation themed papers: Sequences**

**11** Here are the first six terms of an arithmetic sequence.

3            8            13            18            23            28

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

.....  
(2)

The  $n$ th term of a different sequence is  $3n^2$   
Nathan says that the 4th term of this sequence is 144.

(b) Is Nathan right?  
Show how you get your answer.

(1)

**(Total for Question 11 is 3 marks)**

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**1MA1 Foundation themed papers: Sequences**

**12** The  $n$ th term of a number sequence is  $n^2 + 7$

(a) Find the first three terms of this sequence.

.....  
(2)

128 is a term of this sequence.

(b) Which term?

.....  
(1)

**(Total for Question 12 is 3 marks)**

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**13** The  $n$ th term of a sequence is  $2n^2 - 1$

The  $n$ th term of a different sequence is  $40 - n^2$

Show that there is only one number that is in both of these sequences.

**(Total for Question 13 is 3 marks)**

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**1MA1 Foundation themed papers: Sequences**

**14** The first term of a sequence of numbers is 18  
The term-to-term rule for this sequence is “add 6”

(a) Is 603 a term of the sequence?  
You must explain your answer.

.....  
.....

**(1)**

(b) Rizvi says, “No terms of the sequence are multiples of 7”

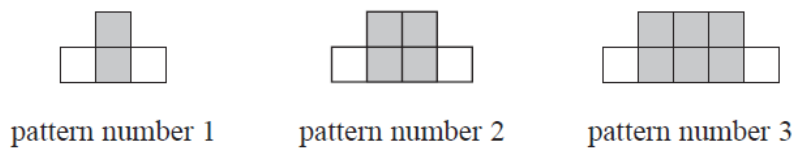
Give an example to show Rizvi is wrong.

.....  
**(1)**

**(Total for Question 14 is 2 marks)**

**1MA1 Foundation themed papers: Sequences**

**15** Here is a sequence of patterns made from grey squares and white squares.



(a) In the space below, draw pattern number 4 (1)

(b) Work out the total number of squares needed to make pattern number 7

.....  
(2)

Aqsa says,

“The total number of squares needed to make pattern number 20 is double the total number of squares needed to make pattern number 10”

(c) Is Aqsa correct?  
Give a reason for your answer.

.....  
.....  
(2)

**(Total for Question 15 is 5 marks)**

**1MA1 Foundation themed papers: Sequences**

**16** The  $n$ th term of a sequence is  $n^2 + 5$

(a) (i) Find the first two terms of this sequence.

.....  
(1)

(ii) Is 126 a term of this sequence?

You must show how you get your answer.

.....  
.....  
.....  
(1)

Here are the first five terms of an arithmetic sequence.

26      19      12      5      -2

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

.....  
(2)

**(Total for Question 16 is 4 marks)**

**1MA1 Foundation themed papers: Sequences**



**17** Here are the first 7 terms of a quadratic sequence.

3   6   11   18   27   38   51

(a) Find the next term in this sequence.

.....  
**(1)**

The  $n$ th term of a different sequence is  $2n^2 + 5$

(b) Work out the 6th term of this sequence.

.....  
**(1)**

**(Total for Question 17 is 2 marks)**

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**1MA1 Foundation themed papers: Sequences**



**18** Here are the first five terms of an arithmetic sequence.

2            7            12            17            22

The  $n$ th term of a different arithmetic sequence is  $4n + 15$

The last term of each sequence is the same number.

There are the same number of terms in each sequence.

Find the number of terms in each sequence.

.....  
**(Total for Question 18 is 3 marks)**

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**TOTAL FOR PAPER IS 55 MARKS**