

1MA1 Higher themed papers: Quadratic sequences

Write your name here			
Surname	Other names		
Centre Number		Candidate Number	
Pearson Edexcel Level 1/Level 2 GCSE (9–1)			
Mathematics Quadratic sequences			
			Paper Reference 1MA1
You must have: 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 π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is **32**. There are **11** 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.

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1 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 1 is 4 marks)

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2 Here are the first 7 terms of a quadratic sequence.

3 6 11 18 27 38 51

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

.....
(2)

(b) Find the 50th term of this sequence.

.....
(1)

(Total for Question 2 is 3 marks)

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3 Here are the first six terms of a quadratic sequence.

−1 5 15 29 47 69

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

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

4 Here are the first five terms of a sequence.

4 11 22 37 56

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

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

5 Here are the first four terms of a quadratic sequence.

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3 8 15 24

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

.....

(3)

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

(b) Show that 36 is **not** a term of this sequence.

.....

.....

(1)

(Total for Question 5 is 4 marks)

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6 The n th term of a sequence is given by $an^2 + bn$ where a and b are integers.

The 2nd term of the sequence is -2 .

The 4th term of the sequence is 12 .

(a) Find the 6th term of the sequence.

.....
(4)

Here are the first five terms of a different quadratic sequence.

0 2 6 12 20

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

.....
(2)

(Total for Question 6 is 6 marks)

7 Here are the first five terms of a sequence.

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−1 0 3 8 15

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

.....
(Total for Question 7 is 2 marks)

- 8** 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 8 is 3 marks)

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9 S is a geometric sequence.

(a) Given that $(\sqrt{x} - 1)$, 1 and $(\sqrt{x} + 1)$ are the first three terms of S, find the value of x .
You must show all your working.

.....
(3)

(b) Show that the 5th term of S is $7 + 5\sqrt{2}$

(2)

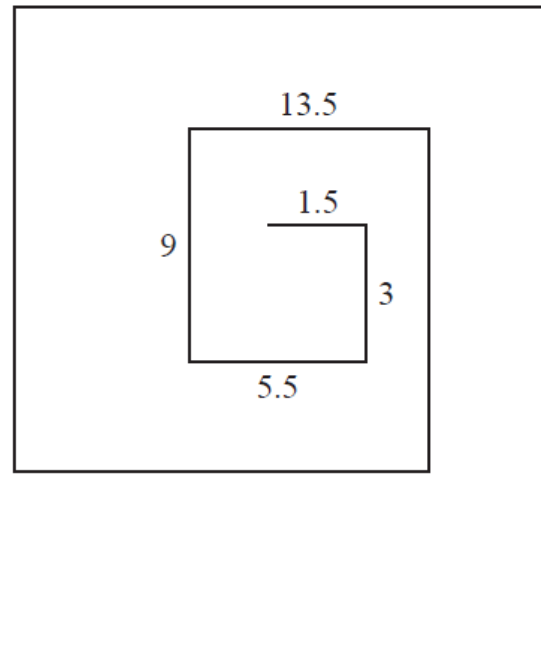
(Total for Question 9 is 5 marks)



10 The diagram shows the first 10 sides of a spiral pattern.
It also gives the lengths, in cm, of the first 5 sides.

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7



The lengths, in cm, of the sides of the spiral form a sequence.

Find an expression in terms of n for the length, in cm, of the n th side.

.....
(Total for Question 10 is 3 marks)

11 Here are the first 5 terms of a quadratic sequence.

- 1 3 7 13 21

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

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

TOTAL MARKS FOR PAPER: 32