

Sequences

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR and Pearson-Edexcel.

Name:	
Total Marks:	

1. Here are the first three patterns in a sequence.



(a) Draw Pattern 4 in this sequence on the grid below.

If the pattern number is odd, the total number of squares will be odd. If it is even, the total number of squares will be even.

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Explain clearly why Sally is right for all patterns in the sequence.

[6] 2. (a) The nth term of a sequence is given by 3n + 5. Explain why 21 is not a term in this sequence. [2] (b) Here are the first three terms in a sequence. 1 2 4 This sequence can be continued in different ways. (i) Find one rule for continuing the sequence and give the next two terms. Rule 1 Next two terms [2] (ii) Find a second rule for continuing the sequence and give the next two terms. Rule 2 Next two terms [2] 3. (a) The nth term of a sequence is given by $2n^2 + 1$. Write down the first three terms of this sequence.

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

2 7 12 17

Write an expression for the nth term of this sequence.

.....[2]

4. (a) Look at this table.

Odd numbers	Total
1	1 ²
1 + 3	2 ²
1 + 3 + 5	3 ²

The pattern in the table continues.

(i) Complete the next row of the table.

(ii) What will be written in the Total column of the 100th row?

.....[1]

[1]

(b) Here is another table.

Even numbers	Total
2	1 ² + 1
2 + 4	2 ² + 2
2+4+6	3 ² + 3
2+4+6+8	4 ² + 4

The pattern in this table continues.

Write an expression for the total of the first n even numbers.

.....[2]



- 5. A sequence is generated using the rule
 - multiply the previous term by 2
 - then subtract 30.

The first term of the sequence is 40.

(a) Find the second term.

.....[2]

(b) Find the fourth term.

-[2]
- 6. The nth term of a sequence is 2n + 1
 The nth term of a different sequence is 3n 1
 Work out the three numbers that are

 in both sequences
 and
 between 20 and 40

[3]

7. Here are the first three patterns in a sequence.The patterns are made from triangles and rectangles.



pattern number 1



pattern number 2



pattern number 3

(a) How many triangles are there in pattern number 7?

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......[2]



Charlie says					
"There are 4 rectangles in p	oattern num	ber 3 so there	e will be 8 re	ctangles in p	oattern
	nu	mber 6″			
(b) Is Charlie right?					
Give a reason for your ar	nswer.				
					[1]
8. Here are the first four terr	ns of an arit	hmetic sequer	nce.		
6 10 14	18				
(a) Write an expression, in t	erms of n, fo	or the nth tern	n of this seq	uence.	
					[2]
The nth term of a different a	rithmetic se	quence is 3n -	+ 5		
(b) Is 108 a term of this seq	uence?				
Show how you get your a	answer.				
					[2]
9. Here are the first six term	s of a Fibon	acci sequence			
1 1	2	3	5	8	
The rule to continue a Fibona	acci sequenc	e is,			
the next term in the se	equence is th	ne sum of the	two previous	s terms.	
(a) Find the 9th term of this	sequence.				
					[1]
The first three terms of a dif	ferent Fibon	acci sequence	are		
а	b	a + b			
(b) Show that the 6th term of	of this seque	nce is 3a + 5l	b		



Given that the 3rd term is 7 and the 6th term is 29, (c) find the value of a and the value of b.

a = b = [3] 10. Here are the first five terms of a sequence. 2 8 18 32 50 (a) Find the next term of this sequence.[1] The nth term of a different sequence is $3n^2 - 10$ (b) Work out the 5th term of this sequence.[1] 11. The first three terms of a number pattern are 1 2 4 Hester says the first five terms of this number pattern are 1 2 4 8 16 (a) Write down the rule Hester could have used to get the 4th and 5th terms.[1] (b) Write down the 6th term of Hester's number pattern.[1] Jack uses a different rule. He says the first six terms of the number pattern are 1 2 4 7 11 16

.wqubb	JUS	n.	patteri	number	s of Jack's	term	nd 8th	e 7th a	down the	(c) Write d
[1].					,					
				quence.	hmetic se	an arit	ns of	ive terr	ne first f	Here are th
					13	9	5	1	-3	
		ence.	s seque	m of this	the nth te	n, for	ns of	, in teri	pression	Find an exp
[2].										
					ession?	progre	netric	a geor	uence is	Which sequ
									answer	Circle your
	7	4	2	1			4	3	2	1
	5	3	2	1			8	4	2	1
[1]										

14. A sequence of patterns uses grey squares and white squares.

Here are the first four patterns.



12.

13.

Pattern 2							

Pattern 3

Pattern 4

Tuchladles



(a) Work out the total number of squares in Pattern 100

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(b) Complete this number machine for the sequence of patterns.

