1(a). Here are the first three dot patterns in a sequence.

Pattern 1	Pattern 2	Pattern 3	Pattern			
•	•	•				
••	• • •	• • • •				
• •	• • •					

Draw Pattern 4 in this sequence.

[1]
(b). Without drawing, work out how many dots are in Pattern 7 of this sequence.
Explain how you worked out your answer.
______ because _______
[2]
(c). Find how many dots are in Pattern 100 of this sequence.

4

_____ [1]



Draw Pattern 4 in this sequence on the grid below.

1	:			 				 	:		 			 	
-															
1															
; ;		 	 	 	 	 		 		 	 			 	
	3 1	 	 • • • • • • •	 	 	 	•••••	 		 	 • • • • • •	• • • • • • •	• • • • • • • • •	 • • • • • •	
	-														
	-							 							
	-														

(b). Pattern 3 has 9 dotted squares and 12 black squares.

How many dotted squares will there be in Pattern 8?

(b) _____ [2]

[2]

(c). Write an expression for the number of **black** squares in the *n*th pattern.

(c) _____ [2]

(d). Sally looks at the patterns. She says

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.

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

[6]



You add 5 and 7 to get 12 to go in the third box.

You add 7 and 12 to get 19 to go in the fourth box.

You add 12 and 19 to get 31 to go in the fifth box.

5	7	12	19	31

Complete these rows of boxes using the rule shown above.

4	6		

(b).

34 55			
		0.1	
		34	55

[2]



F

(d). Use your answer to (c) to help you fill in the missing numbers in this row of boxes.

6		57

4(a).	The <i>n</i> th 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]

F	5(a).	Write dow	n the next t	erm in each	n of these se	equences.		
		5	8	11	14	17		
								-
	(b).	3	6	12	24	48	['	J
							[1	-
	(c).	4	5	7	10	14		
								-

6. Here are the first three patterns in a sequence of dots.

Pattern 1	Pattern 2	Pattern 3	Pattern 4			
		•				
	•	• • •				
•	• • •	• • •				
• • •	• • •	• • •				

- (i) Draw Pattern 4 in the sequence.
- (ii) Without drawing any more patterns, find how many dots there are in Pattern 10. Explain how you decided.

Pattern 10 has _____ dots because _____

7(a). Here are the first three patterns in a sequence.

	Pa	attern 1 Pattern 2						Pa	tteri	n 3									
0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0	0
0				0		0					0		0						0
0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0	0

Complete the table.

Pattern number	1	2	3	4
Number of squares	3			
Number of circles	12			

(b). How many circles are there in Pattern 10? Explain how you decide.

Pattern 10 has _____ circles because _____

[3]

	18	10	2	-6	
	(i) Write down the next ter	m of the sequence.			
			(i)	[1]	
	(ii) Explain how you worke	d out your answer.		[1]	
(b).	The expression for the <i>n</i> th	term of a different sequence	is 6 <i>n</i> – 4.		
	Write down the first three t	erms of this sequence.			
9(a).	Here are the first four numb	ers of a sequence.	, ,	, [2]	
	8	14	20	26	
	Write down the next numbe	er in the sequence.			
				[1]	

(b). Explain how you worked out your answer.

[1]	

10(a) Gary draws this sequence of patterns of white and grey squares.



Draw the next pattern in the sequence on the grid below.



(b). Complete this table.

Number of white squares	2	4	6	8	10
Number of grey squares	6	8	10		

(c). The sequence is continued.

How many grey squares will there be with 16 white squares?

[1]

[1]

(d). Complete the rule for this sequence.



11.

(i) Complete this pattern by filling in the missing numbers.

$3^2 - 1^2 =$	2 × 4
$4^2 - 2^2 =$	2×6
$5^2 - 3^2 =$	2 ×
$6^2 - 4^2 = $	×

(ii) This is another line from the pattern.

100² - 98² = ____ × ____

Complete the line by filling in the missing numbers.

[1]

[2]

[1]

_____ [1]

12(a) Eloise draws this sequence of patterns.

.



Draw the next pattern in the sequence.

(b). Complete this table.

squares	1	2	3	4	5
circles	8	10	12		

(c). The sequence is continued.

How many circles will there be when there are 10 squares?

_____ [1]

OCR GCSE Maths - Sequences (F)

[1]

- (d).
- (i) Complete the rule for the patterns.



(ii) Use this rule to work out how many circles there will be when there are 150 squares.

(ii) _____ [1]

(i) Write down the first three terms of this sequence.

(i) _____ [2] (ii) Is 96 a term in this sequence? Give a reason for your answer. ______ because ______ [1] (b). Here are the first four terms of a different sequence. 16 9 2 -5 Write an expression for the *n*th term of this sequence.

[2]





This table shows the coordinates of the centres of the first four squares.

Complete the table.

Point A, the centre of Square 1	(1,1)
Point B, the centre of Square 2	(,)
Point C, the centre of Square 3	(,)
Point D, the centre of Square 4	(,)

[2]



Write down the coordinates of the centre of Square 20. Show any working that you do.

					(,	.) [4]
D	15(a) Here are the f	irst four terms of a	sequence.				
		5	11	17	23		
	(i) Write dow	n the next term of t	he sequence.				[4]
					(1)		_ ניז
	(ii) Explain ho	w you worked out	your answer.				
							[1]



(b). Here is the rule to find the next term of another sequence.

multiply the previous term by 4 then subtract 3

The first term of the sequence is 10.

Find the second term.



 x	У	 [3]



_____ [2]

	18(a)) Write	the nex	t term	in eac	h of th	ese s	equences.			
		(i)	1	1	2	3	5	8			
										(i)	 [1]
		(ii)	2	4	8	16	32	64			
										(ii)	 [1]
	(b).	Write	an expi	ression	for th	e <i>n</i> th t	erm c	f the sequ	ence below		
Ŭ				15	12	9	6	3			
											 [2]

END OF QUESTION PAPER

Question		n	Answer/Indicative content	Marks	Part marks and guidance			
1	а		• • • • •	1	seen anywhere in (a) Examiner's Comments Nearly all candidates drew the correct pattern. Some candidates were unsure where on the script to draw the pattern so the correct pattern was often seen twice on the script.			
	b		17 Add 2 [each time]	1	Or 2 <i>n</i> + 3 oe contradictory comments score 0 Examiner's Comments Most candidates scored at least 1 mark. Whenever the number of dots was incorrect it was nevertheless usually backed up by a correct reason.	See appendix for exemplars		
	С		203	1	Examiner's Comments Proved more troublesome. 230 was a common incorrect answer for the number of dots in Pattern 100, possibly as this is 10 times the number of dots in Pattern 10. Equally wrong, but less common, was 500 from 100 times the number of dots (5) in Pattern 1.			
			Total	4				
2	а			2	B1 4 × 4 dotted squares correct B1 4 blocks of 4 black squares correct			

Question		'n	Answer/Indicative content	Marks	Part marks and guidance			
	b		64	2	M1 8 × 8 or 8^2 or 8 squared			
	с		4 <i>n</i>	2	M1 4 8 12 seen			
	d		Completely correct proof including reasoning	6	 B1 "blacks always even" + B1 reason B1 "dotteds alternate odd and even" + B1 reason B1 even + even = even B1 odd + even = odd If zero scored B1 shows true for patterns 1, 2 and 3 B1 shows true for at least two more patterns 	Accept "because x 4" or "4 is even" Accept any reason that has explanatory value		
			Total	12		•		
3	а		10, 16, 26	1				
	b		8, 13, 21	2	M1 for one correct subtraction of two boxes			
	с	a + b, a + 2b, 2a + 3b		2	M1 for two expressions correct			
	d		15, 21, 36	3	M1 for <i>their</i> $2a + 3b' = 57$ M1 for substituting $a = 6$ into <i>their</i> final expression and solving for <i>b</i>			
			Total	8				

Question		n	Answer/Indicative content	nd guidance		
4	а		$\frac{21-5}{3}$ is not an integer	2	$M1 \text{ for } \frac{21-5}{3}$ Or M1 for 20 and 23 seen	
	b	i	Any valid rule	1		For example,
		i	Correct next two terms FT <i>their</i> rule	1		'Add one more to the difference each time' 7 11 'Doubling' 8 16
		ii	Any valid rule	1		For example,
ii		ii	Correct next two terms FT <i>their</i> rule	1		'Add one more to the difference each time' 7 11 'Doubling' 8 16 Answer must be different to part (i)
			Total	6		

Qı	Question		Answer/Indicative content	Marks	Part marks a	nd guidance
5	а		20	1		In all parts ignore any additional correct / incorrect terms Examiner's Comments All but a few of the candidates coped successfully with this question. A few offered further terms for the sequences and very occasionally the nth term was offered instead.
	b		96	1		Examiner's Comments All but a few of the candidates coped successfully with this question. A few offered further terms for the sequences and very occasionally the nth term was offered instead.
	С		19	1		Examiner's Comments All but a few of the candidates coped successfully with this question. A few offered further terms for the sequences and very occasionally the nth term was offered instead.
			Total	3		

Question		n	Answer/Indicative content	Marks	Part marks and guidance		
6		i	•	1	Examiner's Comments		
			• • •		This part was rarely wrong.		
			•••				
		ii	31	1			

ii because 3 added on each time 1 or nth term is 3n + 1 oe ignor consee Examiner's Comments 'Examiner's Comments 'Examiner's Comments 'Examiner's Comments 'Examiner's Comments This part caused a few more problems with most candidates scoring at least time 1 mark. A common mistake (1, you answer. Some candidates and (1, you answer. Some candidates 1 is 16, so multiplying by 2 to explain that the answer you answer. Some candidates and (1, you answer. Some candidates 1 is 16, so multiplying by 2 to explain that the answer you answer. Some candidates and (1, you answer. Some candidates 1 is 16, so multiplying by 2 to explain that the answer you answer. Some candidates and (1, you answer. Some candidates 1 is 16, so multiplying by 2 to explain that the answer you answer. Some candidates 1 you answer is 16, so multiplying by 2 to explain the inner the inne	nd guidance
Image: Second	ignore extra non- contradictory statements see exemplars
This part caused a few more problems with most candidates scoring at least 1 mark. A common mistake (1, was to give 30 as the answer. Some candidates thought that the answer (1, was 32 because 'pattern 5 is 16, so multiplying by 2 gives pattern 10'. vert bec 3 m 1) you tabl the mail the ine it gg	'Exemplar responses'
bec new top the [up add (1, 4) incr enc add add patt it's tabl it's it''s it's it's it's it's it''s it's it's it's it's it's it's it's it's it's it's it's	Exemplair responses you keep adding 3 (1, 1) each one is 1 more than 3 times the number pattern (1, 1) you add on 3 every time, and 3 x 6 to get to 10 is 18 (1, 1) you are adding on one dot to each line of the pattern every time (bod referring to vertical lines) (1, 1) because you are adding on 3 more dots each time (1, 1) you go up in the 3 times table and $10 \times 3 = 30$ plus the separate dot at the top makes 31 (1, 1) there is 10 lines of 3 and 1 line of 1 (1, 1) it goes up by 3 dots each pattern (1, 1) dots increase by 3 (1, 1) because each row has 3 new dots and one dot at the top (1, 0) the sequence is going in 3s [up or down?] (1, 0) add 3 [not quite far enough] (1, 0) increase by 3 not quite far enough] (1, 0) add 3 each time (0, 1) add 3(0, 0) pattern 5 has 16 dots so double 16 is 32 giving me pattern 10 (0, 0) it's going up in the 4 times table (0, 0) it goes up by 2 dots (0, 0) it goes up by 2 dots (0, 0) it goes up in the 3 times

Question		n	Answer/Indicative content	Marks	Part marks and guidance
			Total	3	

Question		n	Answer/Indicative content	Marks	Part marks a	nd guidance	
7	а		Squares 4 5 Circles 14 16	1 1			
			Pattern 4: Squares 6 Circles 18	1	Examiner's Comments This was usually correct, with few errors in any of the boxes.		
	b		30	1			
			It goes up 2 each time oe	1	Examiner's Comments Many candidates scored only one out of the two marks, either getting the number of circles right but for the wrong reason or vice versa. 40 was a common wrong response for the number of circles, found by doubling the number of circles corresponding to 5 squares.	Response Add 2 each time Keep adding 2 It is double the number of squares and 6 more for the ends You double the pattern number and add 10 The rule is $2n + 10$ Pattern 5 would have 20. 5 × 2 = 10 which is the difference between 5 and 10. 20 + 10 = 30 Each pattern you add one square and two circles so the answer will be 30 Add 2 The number of circles goes up 2 times You add one square and two circles so the answer will be 30 No MR for 12 (squar instead of 30 circles	Mark (1) (1) (1) (1) (1) (1) (1) (1) (0) (0) (0) (0) (0)
			Total	5			

Question		n	Answer/Indicative content	Marks	Part marks and guidance				
8	а	i	- 14	1	Examiner's Comments Most candidates gained this mark, with a few giving 14 instead of ⁻ 14 ('two minuses make a plus' when joining ⁻ 6 and ⁻ 8) or an answer of 2 as they added 8 instead of subtracting 8. Some thought the difference was 4 (the ⁻ 4 part of the formula) and so gave –2 as an answer. In (ii) there were some very good responses with some giving the <i>n</i> th term of the sequence. Most knew the pattern was to subtract 8, even when they had failed to calculate the next term.				
		ii	subtracted 8	1	Examiner's Comments There were some very good responses with some giving the <i>n</i> th term of the sequence. Most knew the pattern was to subtract 8, even when they had failed to calculate the next term.	Need quantity and direction Exemplar Response - 8 May be written between the listed numbers (1) Subtract 8 (1) Goes down 8 (1) 26 - 8 <i>n</i> oe (1) + 8 (0) Difference of 8 (0) Goes down in 8 times table (0) I plus 8 each time going backwards (0)			

Question	Answer/Indicative content	Marks	Part marks and guidance
b	2, 8, 14	2	M1 for 2 correct terms in correct position or SC1 for -4 , 2, 8 Examiner's Comments A more demanding question where roughly one half of candidates failed to pick up two marks, with only a small percentage gaining the SC1 mark. Many incorrect responses gave 6, 2, 2 which show a misunderstanding of the <i>n</i> th term and the meaning of <i>n</i> , with candidates reading 6 <i>n</i> - 4 as 'start at 6 then subtract 4 each time'. Roughly 20% of candidates either failed to write an answer or had tried to use algebra to find their answers as algebraic ones rather than simplify them into number values. A small number of candidates gained 1 mark for the first two terms correct.
	Total	4	

Qı	Question		Answer/Indicative content	Marks	Part marks and guidance			
9	а		32	1	Examiner's Comments This question was generally well answered.			
	b		Add 6	1	Examiner's Comments Candidates needed to state 'add six'; some simply stated the difference was six, but failed to give the direction. It was encouraging to see some candidates had written 6 <i>n</i> + 2.	needs quantity and direction may be on the sequence Response Going up in 6's (1) +6 (1) 6n + 2 (1) Going up in 6× table (0) 6,s (0)		
			Total	2		-		

Qı	Question		Answer/Indicative content	Marks	Part marks and guidance		
10	а			1	Examiner's Comments Nearly all candidates successfully drew the next diagram in the sequence.	Accept shape if outline is correct. Ignore shading etc	
	b		8 10 12 14	1	Examiner's Comments The table of the sequence was completed correctly by nearly all candidates.		
	С		20	1	Examiner's Comments Most continued the sequence, successfully finding the number of grey squares with 16 white squares. Some candidates doubled the number of grey squares with 8 white squares getting an incorrect answer of 24.		
	d		+4	1	Examiner's Comments An understanding of how to find the rule for the sequence was demonstrated by many. There were a few candidates who did not know what was required and gave no response.	Accept add 4	
	e		92	1	FT from <i>their</i> (d) Examiner's Comments The majority of candidates gave the correct response here, even if their rule was incorrect or missing. Some added rather than subtracting 4 and gave an answer of 100.		
			Total	5			

Q	uestio	n	Answer/Indicative content	Marks	Part marks and guidance
11		i	$5^2 - 3^2 = 2 \times 8$ $6^2 - 4^2 = 2 \times 10$	2	B1 for one line correct Do not accept 10 × 2 Examiner's Comments Most candidates appreciated that there was a pattern and gained both marks. A small number gave 2 × 8, but then did not continue the pattern and continued with answers such as 4 × 5.
		ii	100 ² - 98 ² = 2 × 198	1	Accept 198 × 2 Examiner's Comments This tested their problem solving skills. Few gave an answer from spotting that 198 could be obtained by adding 100 to 98. Many of those, who found the correct solution, computed $100^2 - 98^2$ on their calculator, obtaining 396 and then halving this result.
			Total	3	

Question		n	Answer/Indicative content	Marks	Part marks and guidance		
12	а			1	Examiner's Comments All candidates knew how to draw the next pattern in the sequence. A small number were not careful enough in their drawing and put in extra circles.	Must have 4 'squares' and 14 'dots' how these are set out is not relevant	
	b		Squares 1 2 2 4 5 Circles 8 10 12 14 16	1	Examiner's Comments Completing the sequence in the table was correctly answered by nearly all candidates.		
	C		26	1	Examiner's Comments Those who continued the sequence for another five terms up to ten squares nearly always found the correct answer of 26 circles. A sizeable minority just doubled the number of circles for five squares and gave an answer of 32 circles, not understanding that this would be an incorrect method in this type of sequence.		
	d	i	[+] 6	1	Examiner's Comments A fair number of candidates saw how the rule related to the sequence and gave a correct answer of +6. A common incorrect answer was +2.		

Question		n	Answer/Indicative content	Marks	Part marks and	guidance
		ii	306	1	FT 300 + <i>their</i> (d)(i)	
					Examiner's Comments	
					There was a good number of correct answer for candidates successfully following through from their answer in part (d)(i).	
			Total	5		

iiNo with valid reason1Reasons to involve one of: A All numbers are odd numbers or 96 is even B Use of 91 and 99 C Use of 12.625 D Use of 101 and divide by 8 F 96 is a multiple of 8Response No, all numbers in sequence are odd and 96 even (1 A)No, the sequence is all or numbers or 96 is even B Use of 91 and add 8 E Use of 101 and divide by 8 F 96 is a multiple of 8No, the sequence is all or numbers in sequence (1 A)No, 91 and 99 are in the sequence.No, 91 and 99 are in the sequence (1 B)Many gave a good reason as to why 96 could not be part of the sequence.No, the sequence is + 8, when we come to 91 we have to plus it with 8, so then it becomes 99 (1 B o D)No, because 8×12-5=91 / 8×13-5=99 (1 B)No, 8n - 5 = 96 gives 12.625 which is not an integer (1 C)No, because 101 + 8 = 12.625 (1 C)No, because 8 cannot be added to 91 to get 96 (1 C)	Question	Answer/Indicative content	Marks	Part marks a	nd guidance
A All numbers are odd numbers or 96 is even B Use of 91 and 99 C Use of 12.625 D Use of 91 and add 8 E Use of 101 and divide by 8 F 96 is a multiple of 8No, the sequence is all or numbers in sequence (1 A)Examiner's Comments Many gave a good reason as to why 96 could not be part of the sequence.No, 91 and 99 are in the sequence (1 B)No, because $8 \times 12 - 5 = 91$ / $8 \times 13 - 5 = 99$ (1 B)No, because $8 \times 12 - 5 = 91$ / $8 \times 13 - 5 = 96$ gives 12.625 which is not an integer (1 C)No, because $101 + 8 = 12.625$ (1 C)No, because $8 \times 10 + 8 = 12.625$ (1 C)No, because $8 \times 10 + 8 = 12.625$ (1 C)No, because $8 \times 10 + 8 = 12.625$ (1 C)	ii	No with valid reason	1	Reasons to involve one of:	Response
No, 91 is in the sequence and then we have to add a not 5 (1 D) No, Add 8 to 91 and it give 99 (1 B or D) No, 8 does not go into 10 (1 E)		No with valid reason	1	Reasons to involve one of: A All numbers are odd numbers or 96 is even B Use of 91 and 99 C Use of 12.625 D Use of 91 and add 8 E Use of 101 and divide by 8 F 96 is a multiple of 8 Examiner's Comments Many gave a good reason as to why 96 could not be part of the sequence.	ResponseNo, all numbers in sequence are odd and 96 is even (1 A)No, the sequence is all odd numbers (1 A)No, no even numbers in sequence (1 A)No, 91 and 99 are in the sequence (1 B)No, the sequence is + 8, when we come to 91 we have to plus it with 8, so then it becomes 99 (1 B or D)No, because $8 \times 12 - 5 = 91 / 8 \times 13 - 5 = 96$ gives 12.625 which is not an integer (1 C)No, 12.625 is not an integer (1 C)No, because $101 \div 8 =$ $12.625 (1 C)No, because 8 cannot beadded to 91 to get 96 (1 D)No, 91 is in the sequenceand then we have to add 8not 5 (1 D)No, Add 8 to 91 and it gives99 (1 B or D)No, 8 does not go into 101(1 E)$

Question	Answer/Indicative content	Marks	Part marks and guidance		
				No, because 101 is not in the 8 times table (1 E)	
				No, because 8×12=96 (1 F [implies multiple of 8])	
				No, because 96 ÷ 8 = 12 (1 F [implies multiple of 8])	
				No, because 96 ÷ 8 = 12 – 5 = 91 (1 F [implies multiple of 8])	
				No, because 96 is in the 8 times table so we don't need to subtract 5 (1 F [implies multiple of 8])	
				No, the difference between the terms are adding 8 (0) [no 91]	
				No, it is because the term closest to 96 is 91 which makes it impossible to be the next term (0) [no 99 or add 8]	
				No, because in this sequence if you add 8 you will not get 96 (0) [no 91]	
				No, never in the " + 8 " sequence (0) [no 91]	
				No, <i>n</i> won't be a whole number (0) [insufficient, need to see 12.625]	
				No, 96 is a factor of 8 (0) [incorrect use of factor]	

Question		n	Answer/Indicative content	Marks	Part marks and guidance			
	b		23 – 7 <i>n</i> oe	2	M1 for 7 <i>n</i> seen Examiner's Comments Many candidates found the common difference of 7, but then did not know what to do with it; consequently $n -$ 7 and $23n -$ 7 were common incorrect answers. Others realised that 7 <i>n</i> would be part of the expression and scored 1 mark, but were then unable to go on to find a correct solution.	Condone $s = 23 - 7n$, $t_n = 23 - 7n$ for 2 marks But $n = 23 - 7n$ scores M1 only		
			Total	5				

Question		n	Answer/Indicative content	Marks	Part marks and guidance			
14	а		B(3, 2), C(5, 3) and D(7, 4)	2	B1 for 2 correct pairs Examiner's Comments			
					Nearly all candidates were able to write down the correct coordinates in part (a), with just a small number reversing them.			
	b		<i>x</i> coordinate of 39	3	M2 for $2n - 1$ oe seen or $1 + 19 \times 2$ oe Or M1 for difference of 2 in the sequence for x coordinates soi	working may be seen in the table difference of two can be implied by 2n + 1 or answer of 41 or (9, 5) and (11, 6) soi		
			<i>y</i> coordinate of 20	1	Or SC2 for correct reversed coordinates Or SC1 for <i>x</i> coordinate of 20 following all coordinates reversed in (a) Examiner's Comments Most made an attempt to find the coordinates of the centre of square 20 in part (b). Those who were successful often just listed all the centres systematically and few found a correct, more elegant, approach. A common error was to write down the next centre, (9, 5), and see that to make up the y coordinate to 20 you had to multiply by 4 and then did the same to the x coordinate to obtain an incorrect 36.			
			Total	6				

Question		n	Answer/Indicative content	Marks	Part marks and guidance		
15	а	i	29	1			
		ii	+ 6	1	Examiner's Comments (i) was generally well answered. In (ii) a small number of candidates did not give a quantity and a direction stating for example " I found the difference".	need direction and quantity, 6 <i>n</i> – 1 Maybe on diagram	
	b		37	2	M1 for 10 × 4 soi by 40 Examiner's Comments This was well answered.		
			Total	4			

Question		'n	Answer/Indicative content	Marks	Part marks and guidance
16	a		18, 29	1	Ignore subsequent termsExaminer's Comments A large number of candidates were unaware of the properties of a Fibonacci sequence, so were unable to access this question. The most common error in (a) was 16, 22 from adding 5 and then 6. In (b) the common error was to find the difference between 31 and 50 then repeatedly subtract this value (19), sometimes ending with negative solutions. The majority of candidates were unable to deal with the algebraic terms in (c), with some using number terms from the previous answers. Some gained marks for $y - x$ and $x + y$ although sometimes the first term was given as $x - y$. Very rarely was $x + 2y$ seen as the last term.
	b		7	2	M1 for the term before 31 is 19 soi Condone 7, 12, 19, for 2 marks. M0 if a 19 is just seen as the difference

Question		n	Answer/Indicative content	Marks	Part marks and guidance		
	с		First term is $y - x$	1		Condone	
			Fourth term is $x + y$ Fifth term is $y + x + y$ or $2y + x$ oe	1 1FT	FT their Fourth term + y	their correct expressions equated to different variables eg 2y + x = n etc <i>Their Fourth</i> <i>term</i> an expression in <i>x</i> and / or <i>y</i>	
			Total	6		•	1

Q	Question		Answer/Indicative content	Marks	Part marks and guidance		
17	а	İ	15 11	1	Examiner's Comment This part was answered correctly by the vast majority of students. In this part, students occasionally added 4 instead of subtracting it.		
		ii	38 193	1	Examiner's Comment Other numerical errors were seen in this part, where the 2nd value was occasionally incorrect following a correct 1st value.		

Question	Answer/Indicative content	Marks	Part marks and guidance
b	4 <i>n</i> + 1 oe	2	B1 for $4n + k$ Accept $n4$ (if k may be 0 $n \text{ or } n^4$) and $n \times 4$ and 4 $\times n$ $oe 5 + (n - 1) \times 4$ scores 2 marks Condone $\times =$ and $n^{\text{th}} =$ and $n^{\text{th}} =$ and $n^{\text{th}} =$ and $n^{\text{th}} =$ 4n + 1 for 1 marks Condone $n =$ 4n + 1 for 1 mark Examiner's Comment Finding the <i>n</i> th term in this part proved far more challenging. While some were awarded a mark for $4n$ + k, (with $k = -1$ being seen most often), the most common wrong answers were $+4$, $n + 4$ and giving the next value in the sequence (i.e. 21).
	Total	4	

Question		n	Answer/Indicative content	Marks	Part marks and guidance		
18	а	i	13	1	Ignore subsequent terms		
		ii	128	1	Ignore subsequent terms		
	b		18 – 3 <i>n</i> oe	2	M1 for $-3n$ + k oe or for $mn + 18$ oddeneeg $n = 18 - 3n$ For 2 or M1, condone use of other variable instead of n Examiner's CommentsIn the first part of (a) answers were split between 		
			Total	4			