Q1. The first four terms of an arithmetic sequence are

6 11 16 21

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

.....

(Total 2 marks)

Q2. Here are the first 5 terms of a number sequence.

2 5 8 11 14

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

.....

(ii) Explain how you got your answer.

.....

.....

(2)

(b) Work out the 8th term in the sequence.

(1)
(Total 3 marks)

Q3. Here are the first four terms of an arithmetic sequence.

5 9 13 17

(a) What is the next term of this sequence?

.....

(1)

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

.....

(2)
(Total 3 marks)

Q4. Here are the first 5 terms of an arithmetic sequence.

5 8 11 14 17

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

.....

(2)

The expression $3n^2 + 2$ is the nth term of another sequence.

(b) Find the 4th term of this sequence.

.....

(2)
(Total 4 marks)

Q5. Here are the first four terms of an arithmetic sequence.

5 8 11 14

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

.....

(Total 2 marks)

Q6. The n th term of a sequence is $n^2 + 4$

Alex says

"The n th term of the sequence is always a prime number when n is an odd number."

Alex is wrong.

Give an example to show that Alex is wrong.

(Total 2 marks)

Q7. Here are the first 4 terms in a number sequence.

2 5 8 11

(a) Write down the next term in this number sequence.

.....

(1)

Here are the first 4 terms in another number sequence.

18 13 8 3

(b) Write down the next term in this number sequence.

.....

(1)
(Total 2 marks)

Q8. The nth term of a number sequence is $n^2 + 1$

Write down the first three terms of the sequence.

.....

(Total 2 marks)

Q9. Here are the first 4 terms in a number sequence.

124 122 120 118 ....

(a) Write down the next term in this number sequence.

.....

(1)

(b) Write down the 7th term in this number sequence.

.....

(1)

9 cannot be a term in this number sequence.

(c) Explain why.

.....

(1)

(Total 3 marks)

Q10. The nth term of a sequence is $2n^2$

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

.....

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

.....

Give reasons for your answer.

(Total 3 marks)

M1.

Answer	Mark	Additional Guidance
$5n + 1$	2	**B2** for $5n + 1$ oe (**B1** for one of $5n$ + a)
		Total for Question: 2 marks

M2.

	Answer	Mark	Additional Guidance
(a)(i)	17	2	**B1** for 17 cao
(ii)	add 3 (each time)		**B1** for add 3 oe
(b)	23	1	**B1** for 23 cao
			Total for Question: 3 marks

M3.

	Answer	Mark	Additional Guidance
(a)	21	1	**B1** cao

(b)	$4n + 1$	2	**M1** for $4n + k$ ($k \neq 1$) **A1** oe NB $n = 4n + 1$ gets **M1** only.
			Total for Question: 3 marks

M4.

	Working	Answer	Mark	Additional Guidance
(a)		3n + 2	2	**B2** for 3n + 2 or equivalent [B1 for 3n + k where k ≠ 2]
(b)	3 × 2 4 + 2 = 3 × 16 + 2 = 48 + 2	50	2	**M1** for $3 \times 4^2 + 2$ with a clear intention to square the 4 independent of the scalar 3 **A1** cao
				Total for Question: 4 marks

M5.

Answer	Mark	Additional Guidance
$3n + 2$	2	**B2** for $3n + 2$ (oe, including un-simplified) (**B1** for $3n + k$, $k \neq 2$)
		Total for Question: 2 marks

M6.

Working	Answer	Mark	Additional Guidance
5, 13, 29, 53, **85, 125**	**(85)**	2	**M1** for correct evaluation of at least 3 odd cases **OR** sequence of 5, (8), 13, (20), 29… seen **OR** the expression with n = 9 or 11 or 19 or 21 or substituted but not evaluated **A1** for 85 or 125 or 365 or 445 or … identified
			Total for Question: 2 marks

M7.

	Answer	Mark	Additional Guidance
(a)	14	1	**B1** cao
(b)	–2	1	**B1** cao
			Total for Question: 2 marks

M8.

Working	Answer	Mark	Additional Guidance

$1^2 + 1$ $2^2 + 1$ $3^2 + 1$	2, 5, 10	2	**M1** for $1^2 + 1$ or $2^2 + 1$ or $3^2 + 1$ (but not $1^2 + 1$, $2^2 + 2$, $3^2 + 3$) **A1** for 2, 5, 10 SC: **B1** for 1, 2, 5 with or without working
			Total for Question: 2 marks

M9.

	Answer	Mark	Additional Guidance
(a)	116	1	**B1** for 116 [accept 114 if 116 seen on the dotted line in the sequence]
(b)	112	1	**B1** cao
(c)	it is odd (and all the terms are even)	1	**B1** for a correct reason
			Total for Question: 3 marks

M10.

	Working	Answer	Mark	Additional Guidance
(i)		32	1	**B1** cao
(ii)	$2n^2 = 400$, $n^2 = 200$, n not a whole number	No + explanation	2	**M1** sets $2n^2 = 400$ **C1** and concludes correctly

				OR **M1** 14th term is (392), 15th term is (450) **C1** and concludes correctly
				Total for Question: 3 marks

E1. Though the concept was well understood it was disappointing to see about half the candidates writing $n + 5$ instead of $5n + 1$ for the nth term of the sequence.

E2. A well understood question with a good success rate. Almost all candidates gained all 3 marks though some candidates did get muddled when finding the 8th term of the sequence.

##

Foundation

Part (a) was usually answered correctly, and in part (b) most candidates realised that the answer had to include a "4" somewhere. Unfortunately for many this was not with an n. Common errors included $n + 4$ or just "+4".

Higher

Part (a) proved to be a good starter question with nearly all candidates being able to provide the next term in the sequence.

In part (b) the most common incorrect answer was $(n + 4)$. Those who scored 1 mark tended to write $4n$ on its own.

E5. **Foundation**

Many candidates found the number differences as "+3" but where then unable to use this to successfully write down a generalisation of even $3n$. There were lots of 3, +3, $n = 3$ and $n + 3$, or common incorrect answers such as $2n + 3$. Overall a question that was beyond many candidates.

Higher

Very good answers at this level. There were few errors – mainly of the $n + 3$ variety or $n = 3n + 2$. A few candidates had not learned the rule carefully enough and wrote $2n + 3$, which, of course, gives the first term.

E6. Foundation

This question was very poorly done with most candidates having no idea as what was required. Many substituted even numbers whilst others substituted odd numbers and then did not know what a prime number was. Others did get a correct value of n but then failed to evaluate their expression, losing the final accuracy mark. A significant number took n^2 to mean $2 \times n$ and consequently their evaluations were incorrect. Only 13% of the candidates scored any marks on this question.

Higher

This question was either done well or very badly indeed with 35% of candidates gaining full marks but 60% of candidates scoring zero. Too many gave even numbers in their answer and so did not show three acceptable examples for the first mark. The correct answer was usually n = 9 but there were some with $n = 11$ and even $n = 25$ (629) and $n = 27$ (533). Some did lots of calculations but did not identify their chosen result. There did seem at times to be some confusion between odd and prime numbers.

E7. This question was extremely well done. A few gave more terms than was necessary in part (a) but were not penalised for this.

E8. On the whole this question was well answered, with most candidates stating the answer only. There were a few common wrong responses which included omitting the plus 1 to obtain "1, 4, 9"; using $n = 0$ for the first term to obtain "1, 2, 5"; incorrectly evaluating 3^2 as 6 to obtain "2, 5, 7". Perhaps the most common incorrect response came from those who treated it as an iterative process to gain "2, 5, 26".

Some candidates did not evaluate the expression but used "$n^2 + 2$, $n^2 + 3$" as the next terms.

E9. The identification of subsequent terms in this sequence was usually correctly done. Some candidates wrote the next term (116) on the dotted line of the sequence and gave an answer of 114 in part (a). This was not penalised and the mark was awarded. Whilst in part (b) the correct answer of 112 was usually given, a few candidates found the seventh subsequent term (104) in error.

In part (c), the majority of candidates were awarded the mark for responses of "because they are all even" or "because 9 is an odd number". Many candidates felt that it was sufficient just to say something like "because the numbers go down in 2's". This gained no credit.

Several candidates used the word 'uneven' to describe odd and 'equal' to describe even.