  
HIGHER: SEQUENCES – This is a selection of the types of question that you need to be able to solve.

**Q1.**

The *n*th term of a number sequence is 2*n* + 1

Write down the first 3 terms of the number sequence.

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**(Total for question = 2 marks)**

**Q2.**The *n*th term of sequence A is 3*n* − 2   
The *n*th term of sequence B is 10 − 2*n*

Sally says there is only one number that is in both sequence A and sequence B.

Is Sally right?   
You must explain your answer.

**(Total for question = 2 marks)**

**Q3.**

Here are the first five terms of an arithmetic sequence.

2        5        8        11        14

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

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**(2)**

(b)   Is 299 a term of this sequence?

You must give a reason for your answer.

**(2)**

(c)   Write down an expression, in terms of *n*, for the (*n* + 1)th term of this sequence.

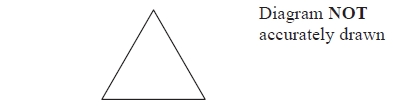
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**(1)**

**(Total for question = 5 marks)**

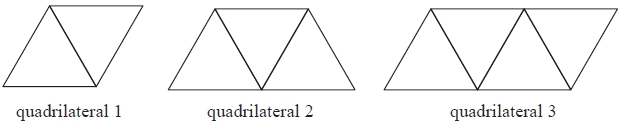
**Q4.**

Here is an equilateral triangle.



The equilateral triangle has a perimeter of 24 cm.

Some of these equilateral triangles are used to make this sequence of quadrilaterals.



Find an expression for the perimeter, in centimetres, of quadrilateral *n*.

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**(Total for question = 3 marks)**

**Q5.**

Here are the first four terms of a quadratic sequence 3          8          15          24

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

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**(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 = 4 marks)**

**Q6.**

Here are the first five terms of a sequence 4 11 22 37 56

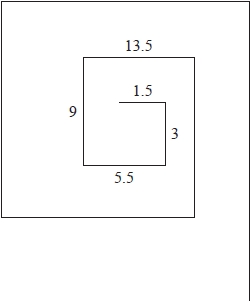
Find an expression, in terms of *n*, for the *n*th term of this sequence.

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**(Total for question = 3 marks)**

**Q7.**

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



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.

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**(Total for question = 3 marks)**

**Q8.**

Here are the first six terms of a Fibonacci sequence.

1         1         2         3         5         8

The rule to continue a Fibonacci sequence is,

the next term in the sequence is the sum of the two previous terms.

(a)  Find the 9th term of this sequence.

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**(1)**

The first three terms of a different Fibonacci sequence are

*a         b         a + b*

(b)  Show that the 6th term of this sequence is 3*a* + 5*b*

**(2)**

Given that the 3rd term is 7 and the 6th term is 29,

(c)  find the value of *a* and the value of *b*.

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**(3)**

**(Total for question = 6 marks)**

**Q9.**

S is a geometric sequence.

(a)  Given that  are the first three terms of S, find the value of *x*.

You must show all your working.

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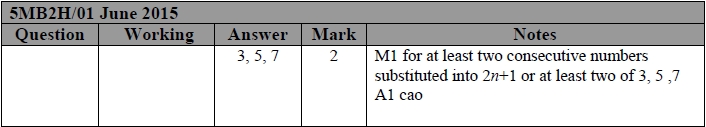
**(3)**

(b)  Show that the 5th term of S is 

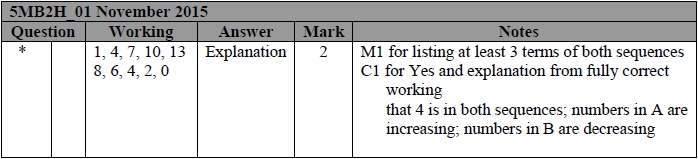
**(2)**

**(Total for question = 5 marks)**

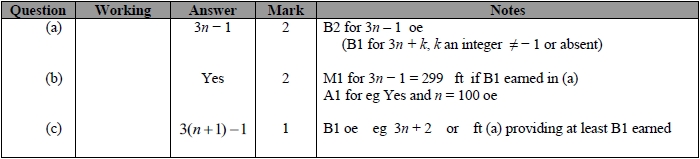
**Mark Scheme**  
Q1.



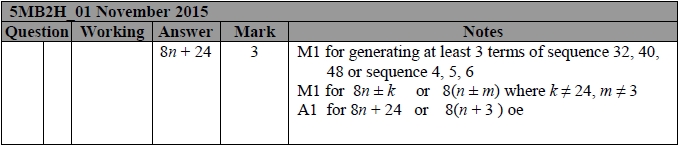
**Q2.**



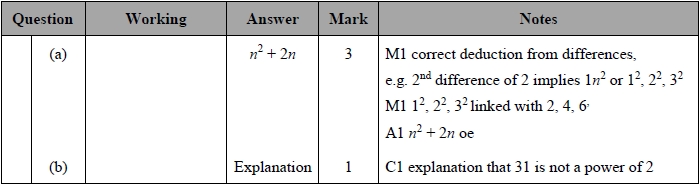
**Q3.**



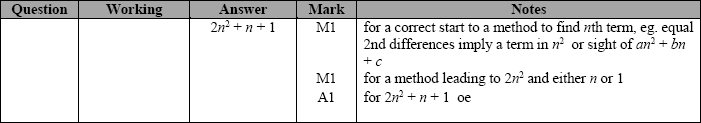
**Q4.**



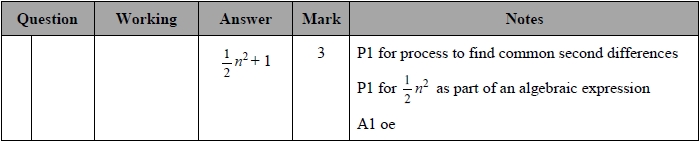
**Q5.**



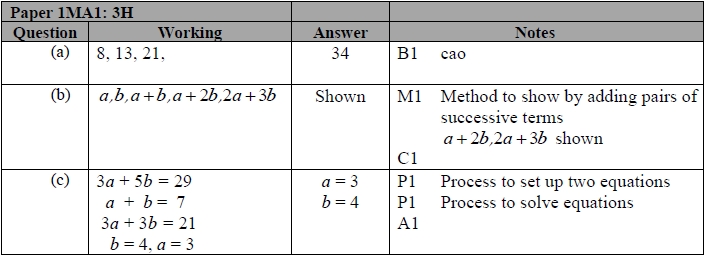
**Q6.**



**Q7.**



**Q8.**



**Q9.**

