

Name:.....

Total Marks:.....

# GCSE (9-1) Grade 8/9

## Nth Term of a Quadratic Sequence



### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions.
- Answer the questions in the spaces provided
  - there may be more space than you need.
- **Show all your working out**

### Information

- The total mark for this paper is 85.
- The marks for **each** question are shown in brackets.
  - use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed

### Advice

- Read each question carefully before you start to answer it
- Attempt every question
- Check your answers if you have time at the end



1. Write down the next two terms in the following sequence

6, 9, 14, 21, ...

.....

**(2 marks)**

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2. Write down the next two terms in the following sequence

4, -5, -18, -35, ...

.....

**(2 marks)**



3. The  $n$ th term of a sequence is

$$2n^2 + 3n - 2$$

Work out the 8<sup>th</sup> term of the sequence

.....

**(2 marks)**

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4. The  $n$ th term of a sequence is

$$n^2 + 3n - 1$$

Write down the first 5 terms in the sequence

.....

**(2 marks)**



5. Find an expression, in terms of  $n$ , for the  $n$ th term of the quadratic sequence:

2, 3, 6, 11, 18

.....

**(4 marks)**

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6. Find an expression, in terms of  $n$ , for the  $n$ th term of the quadratic sequence:

3, 10, 19, 30, 43

.....

**(4 marks)**



7. Find an expression, in terms of  $n$ , for the  $n$ th term of the quadratic sequence:

-1, 0, 3, 8, 15

.....

**(4 marks)**

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8. Find an expression, in terms of  $n$ , for the  $n$ th term of the quadratic sequence:

-2, 4, 14, 28, 46

.....

**(4 marks)**



9. Find an expression, in terms of  $n$ , for the  $n$ th term of the quadratic sequence:

6, 10, 12, 12, 10

.....

**(4 marks)**

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10. Find an expression, in terms of  $n$ , for the  $n$ th term of the quadratic sequence:

-2, -1, 1, 4, .....

.....

**(4 marks)**



**11.** Here are the first 6 terms of a sequence.

9    4    -5    -18    -35

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

.....

**(4 marks)**

(b) Hence find the term that has value  $-1215$

.....

**(2 marks)**



12. Here are the first 5 terms of a sequence.

7 16 29 46 67

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

.....  
(4 marks)

(b) Hence find the term that has value 862

.....  
(2 marks)





**13.** Here are the first 5 terms of a sequence.

3    9    17    27    39

Claire says that 161 is a term of this sequence

(a) Is Claire correct? Give a reason for your answer

.....

**(4 marks)**

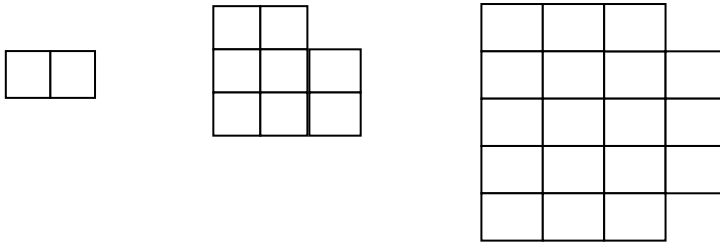
Rob says that all the terms in the sequence are odd numbers

(b) Is Rob correct? Give a reason for your answer.

.....

**(2 marks)**

14. Here are some patterns made from square slabs.



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

.....

**(4 marks)**

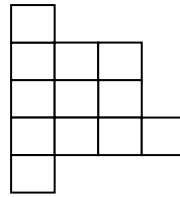
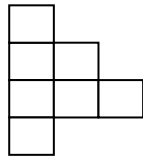
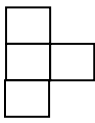
(b) Jane says that 75 is a term in the quadratic sequence.

Is Jane correct? Give a reason for your answer.

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**(2 marks)**

15. Here are some patterns made from tiles.

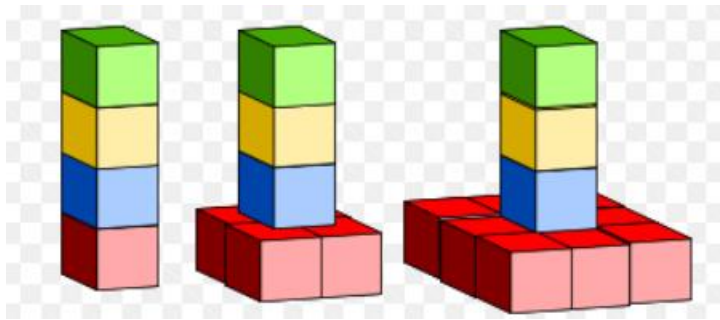


Find an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

.....

**(4 marks)**

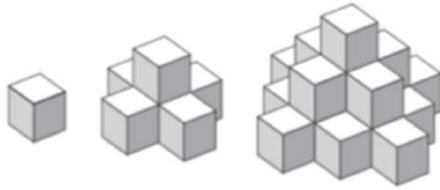
16. Here are some patterns made from cubes.



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

.....

17. Here are some patterns made from cubes.



(a) Work out the number of cubes needed to make the next pattern.

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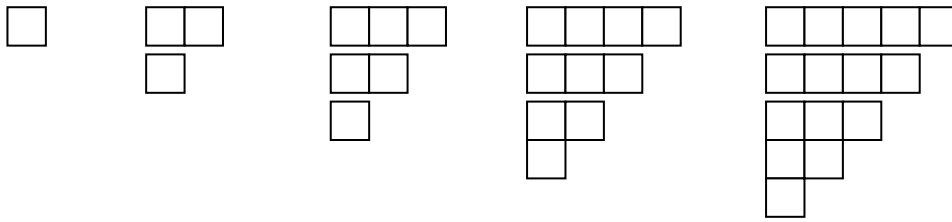
(2 marks)

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

.....

(4 marks)

18. Here is a sequence of patterns made from centimetre squares.

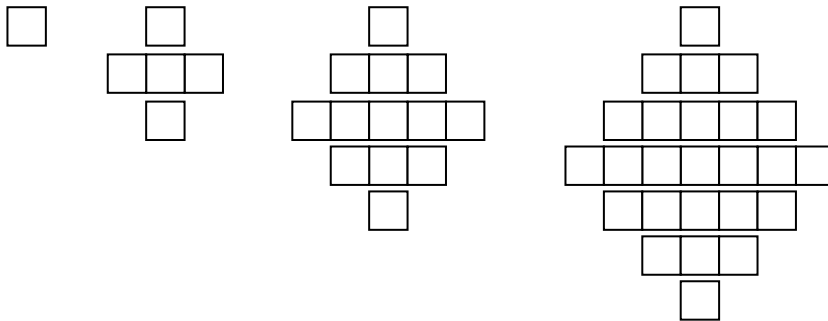


Find the number of centimetre squares in the 100th pattern.

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(5 marks)

19. Here is a sequence of patterns made from centimetre squares.

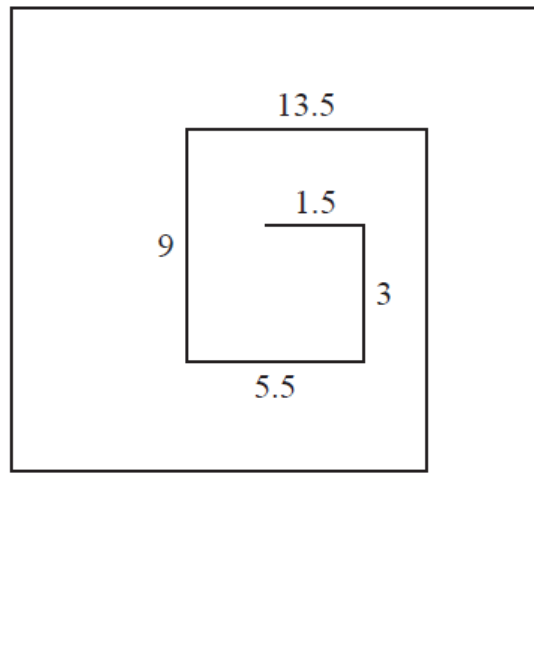


Find an expression in terms of  $n$  for the number of centimetre squares in the  $n$ th pattern.

.....

(5 marks)

20. 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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(3 marks)

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**TOTAL FOR PAPER IS 85 MARKS**