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| Surname | |
| Other Names | |
| Candidate's Signature | |

GCSE 9 - 1 Questions

Quadratic Sequences

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

Write your name in the space provided.

Write your answers in the spaces provided in this question paper.

Answer ALL questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You should have a ruler, compass and protractor where required.

Total Marks :

- 1) (a) Write down the next two terms of the sequence

16, 14, 10, 4,

Answer _____, _____ [2]

- (b) Write down the first three terms of the sequence with n th term given by $n^2 + 2$

Answer _____, _____, _____ [2]

- 2)(a) The n th term of a sequence is $3n^2 - n$.
Write down the first three terms of the sequence. [2]

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- (b) Find the n th term of each of the following sequences.

- (i) 7, 18, 29, 40, 51, [2]

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- (ii) -2, 1, 6, 13, 22, 33, [2]

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
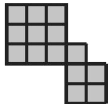
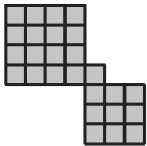
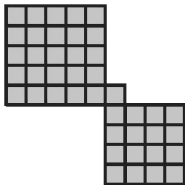
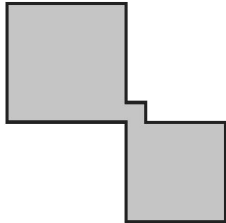
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3) Use the table below to find an expression for the number of small squares in pattern number n . [3]

| Pattern number | Shape | Number of small squares |
|----------------|---|-------------------------|
| 1 |  | 6 |
| 2 |  | 14 |
| 3 |  | 26 |
| 4 |  | |
| | | |
| n |  | |

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4)(a) Write down an expression for the n th term of the following sequence.

8, 17, 26, 35, 44,

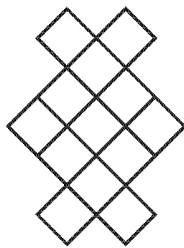
[2]

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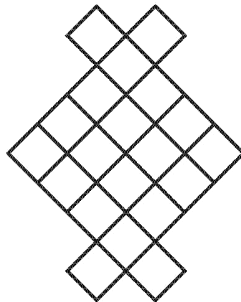
n th term

(b) The following patterns are made using small squares.

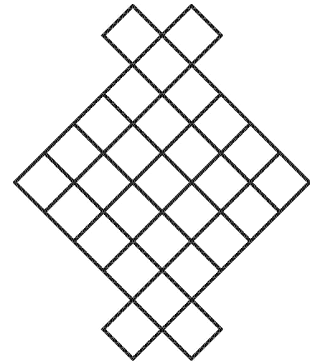
Pattern 1



Pattern 2



Pattern 3

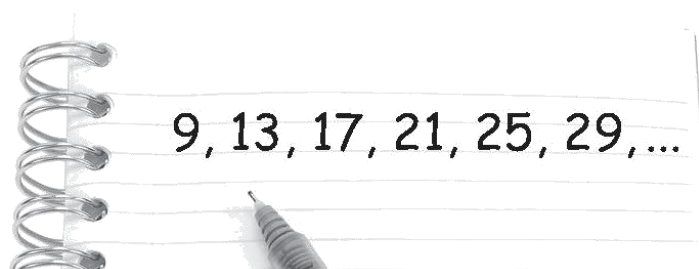


Write an expression for the number of small squares in pattern n .

[3]

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5) Dewi writes the first 6 numbers of a sequence on a notepad.



- (a) (i) Write down the n th term of Dewi's sequence. [2]

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- (ii) Carys says that 149 is in Dewi's sequence.
Is Carys correct?
You must explain your answer. [1]

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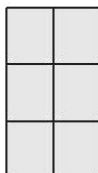
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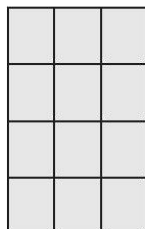
- (b) Val works for WindPane, a company that makes rectangular windows using small panes of glass.
All the small panes of glass are the same size.

Val has drawn patterns of windows and the panes of glass, as shown below.

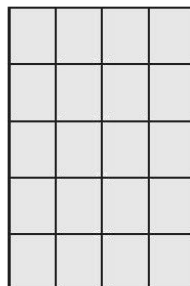
Pattern 1



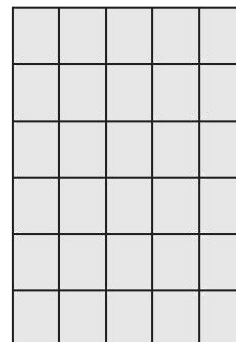
Pattern 2



Pattern 3



Pattern 4



- (i) Imran says that there would be 110 panes in Pattern 8.
Is Imran correct?
You must explain your answer.

[2]

- (ii) Val says that Pattern n contains $n^2 + 3n + 2$ panes of glass.
Is Val correct?
You must show your working and justify your answer.

[2]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

- 6) The n th term of a sequence is given by $n^2 + 7$.

Write down the first three terms of this sequence.

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1st term =

2nd term =

3rd term =