Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Generating Sequences

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

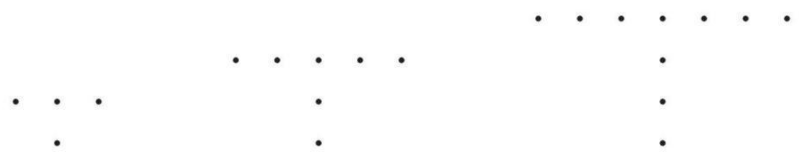
- Write your name in the space provided.
- Write your answers in the spaces provided in this question paper.
- Answer ALL questions.
- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

Total Marks :

1) Write down the first three terms of the sequence which has an nth term of $n^3 + 1$

Answer _____ , _____ , _____ [2]

2) "T" shapes are formed using dots.



Shape 1 **Shape 2** **Shape 3** **Shape 4**

(a) Draw Shape 4 [1]

(b) Complete the table for Shape 4 and Shape 5

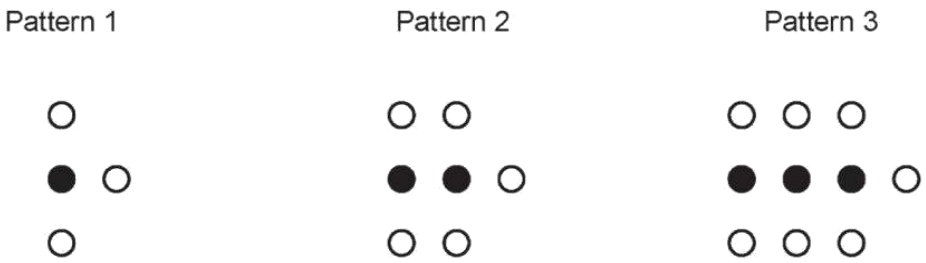
Shape	1	2	3	4	5
Number of dots	4	7	10		

[1]

(c) How many dots would be in Shape 11?

Answer _____ [2]

3) Patterns made with black and white circles are shown below.



Complete the following statements, in terms of n. [3]

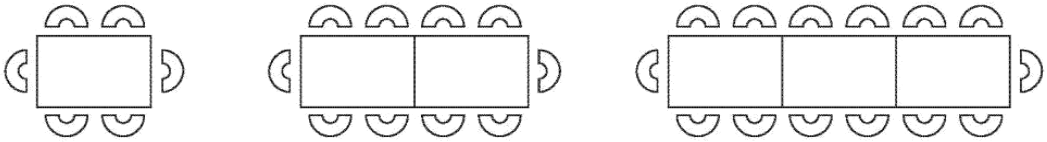
'There will be ..... black circles in Pattern n.'

'There will be ..... white circles in Pattern n.'

.....

.....

4) Seating arrangements around 1, 2 and 3 tables are shown below.
Tables must be placed only side by side in one row.



(a) In the space below, draw a seating arrangement for a row of 4 tables. [1]

(b) Complete the following table for the seating arrangements. [2]

Number of tables	**1**	**2**	**3**	**4**	**5**
Number of seats	6	10			

(c) Complete the following formula which connects the number of seats and the number of tables. [2]

Number of seats = ...

(d) How many seats are there around a row of 7 tables? [1]

.....

.....

(e) How many tables are needed for 82 seats? [2]

.....

.....

.....

.....

5) The shapes below are made from matchsticks.

Shape 1 Shape 2 Shape 3 Shape 4

Shape 5

(a) Draw Shape 5 above. [1]

(b)

Shape number	1	2	3	4	5	6
Number of matchsticks	5	7	9	11		

Complete the table, showing the number of matchsticks in each shape. [1]

(c) What pattern do you notice in the second row in the table?

Answer _____ [1]

(d) Find the number of matchsticks in Shape 12.

Answer _____ [2]

6) Look at the pattern of squares and triangles.

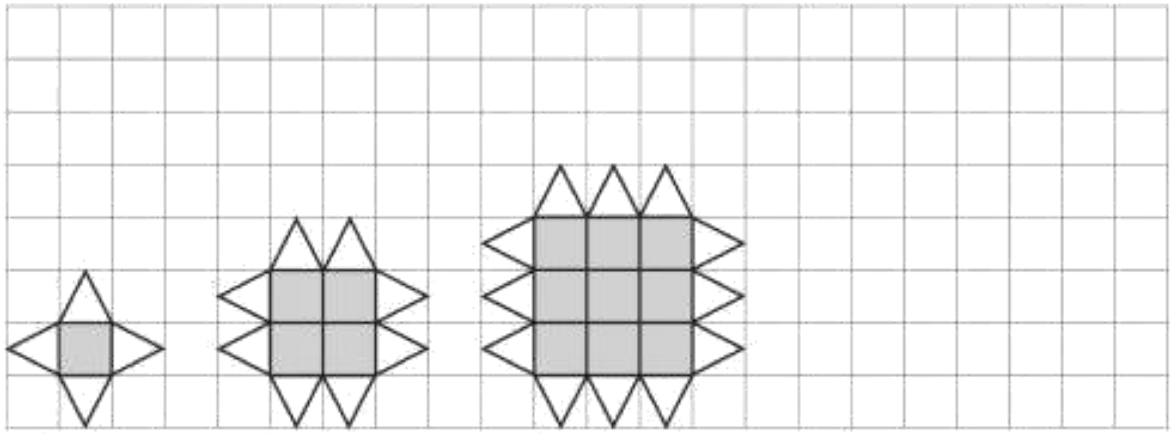


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(a) On the grid, draw Diagram 4 [1]

(b) Complete the table below.

Diagram	**1**	**2**	**3**	**4**	**5**
Number of squares	1	4	9		
Number of triangles	4	8	12		

[2]

(c) If the pattern was continued one diagram would have 64 squares. How many triangles would be in that diagram?

Answer _____ [2]