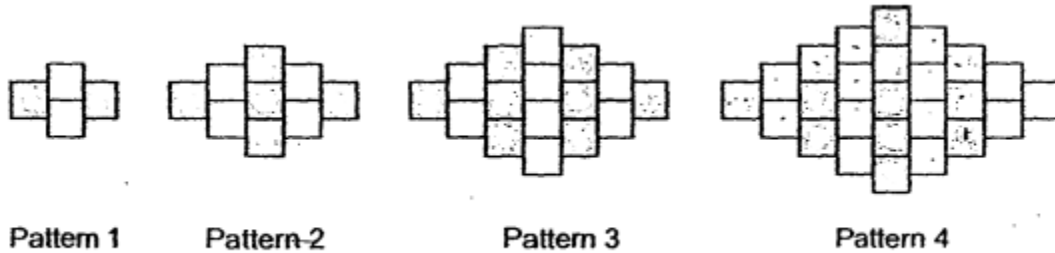


Zach used some white and grey tiles to form some patterns. The first four patterns are shown below.



The table shows the number of white and grey tiles used to form the patterns.

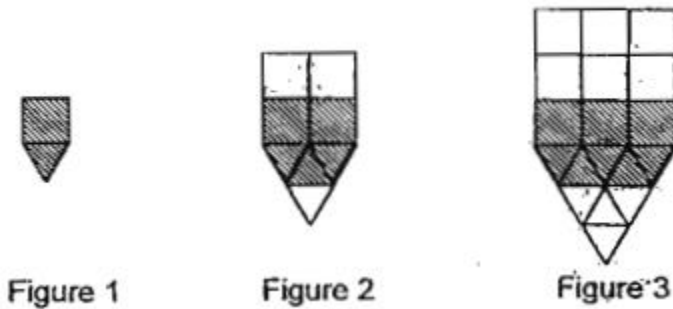
Pattern Number	Number of grey tiles	Number of white tiles	Total number of tiles
1	2	2	4
2	5	4	9
3	8	8	16
4	13	12	25
5			

- Complete the table above for Pattern 5.
- How many tiles were used to form Pattern 80?
- How many grey tiles were used to form Pattern 120?

The series of figure below are made up of unit squares and unit triangles.

In the figures below, a unit square is represented by \square and a unit triangle is represented by \triangle .

Study the patterns carefully and answer the questions that follow.



(a) Complete the following table.

Figure Number	Number of Unit Squares (Shaded and Unshaded)	Total Number of Shaded Unit Squares and Shaded Unit Triangles	Total Number of Unit Squares and Unit Triangles (Shaded and Unshaded)
1	1	2	2
2	4	5	8
3	9	8	18
4			

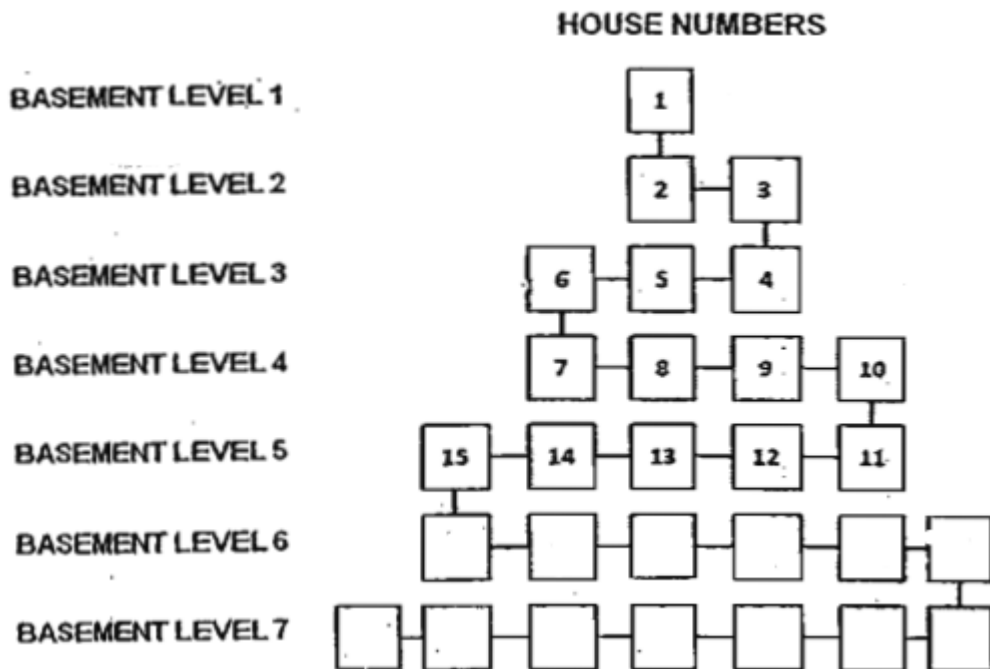
(b) Find the number of unit squares in Figure 20.

(c) Find the figure that has a total of 101 shaded unit square and shaded unit triangles.

(d) Find the total number of unit squares and unit triangles in Figure 25.

In the village of Happy people, the villagers built their houses underground as shown in the figure below.

- Fill in the house Numbers of Basement Level 6 in the figure below.
- Miss Sunshine stays in the house on the extreme right of Basement Level 10. What is her House Number?
- Mr Beam stays at Basement Level 100. What is the smallest House Number on Mr Beam's level?



Each of the figures below is made up of 1-cm sticks.

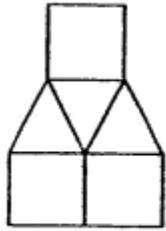


Figure 1

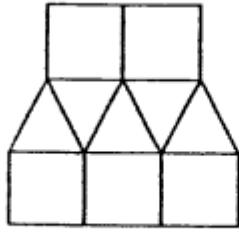


Figure 2

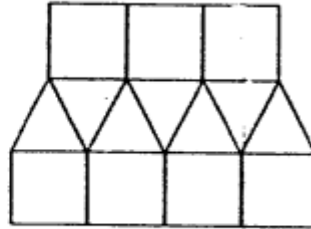


Figure 3

The table shows the number of sticks used to make the above figures and their perimeters.

Figure	Number of sticks	Perimeter of figure	(cm)
1	15	9	
2	23	11	
3	31	13	
....	
11		29	

- Complete the table above for figure 11.
- What is the perimeter of Figure 179?
- Which figure requires a total number of 4151 sticks?

The average of 6 numbers on a piece of paper is 50. A digit from each of the last two numbers are missing. What is the sum of the value of the two missing digits?

48	36	42	58	5		6
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Study the following pattern.

	Column A	Column B	Column C	Column D	Column E	Column F	Column G
Row 1		1		2		3	
Row 2	7		6		5		4
Row 3		8		9		10	
Row 4	14		13		12		11
Row 5		15		16		17	
Row 6
:		:		:		:	

- In which column will the number 80 appear?
- What number will in Row 99 Column D?

Study the pattern below and answer the questions, showing your workings clearly whenever possible.

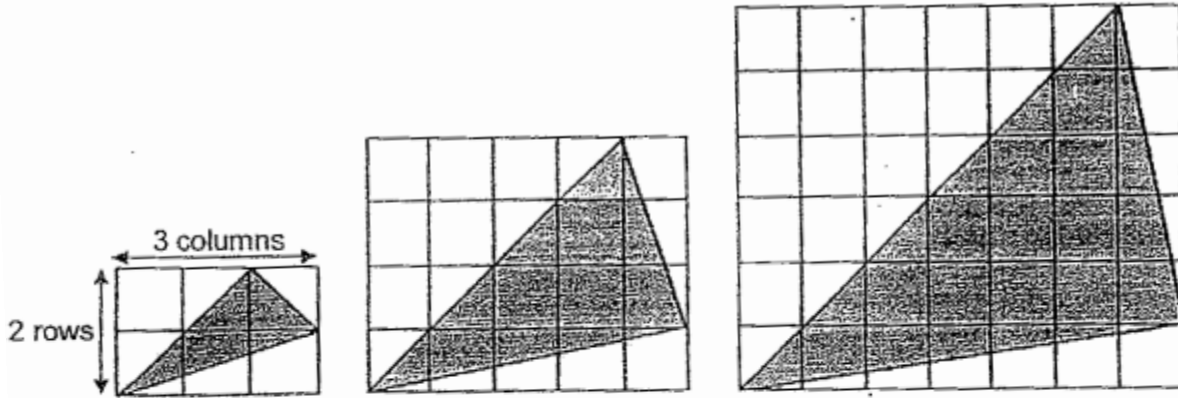


Fig. 1

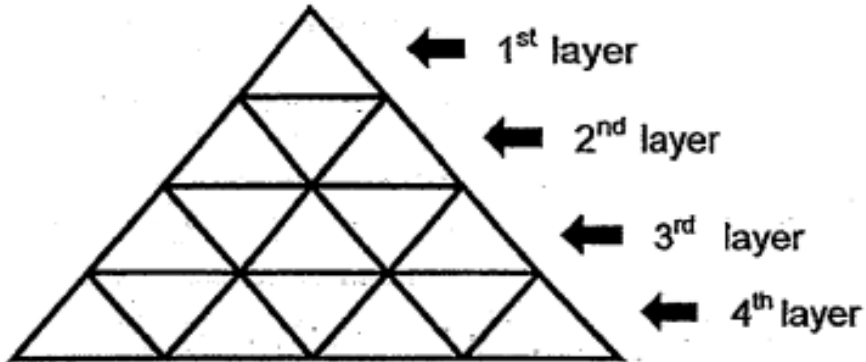
Fig. 2

Fig. 3

Figure no.	No. of rows of square grids	No. of columns of square grids	Area of shaded triangle (square units)
1	2	3	2
2	4	5	8
3	6	7	18
4	8	9	?

- What is the area of shaded triangle in Figure 4?
- What is the number of columns of square grids in Figure 20?
- In which figure would the area of shaded triangle be 2312 square units?

The figure is made up of identical triangles.



(a) Complete the table for layers 5 and 10.

Layer	Number of Triangles
1	1
2	3
3	5
4	7
5	(i)
.	.
.	.
.	.
10	(ii)

(b) Each small triangle has a base of 4 cm and a perpendicular height of 3 cm. Find the area of all the triangles at the 30th layer.

The table below shows the method used to compute the sum of different sets of consecutive number.

Sum of numbers from 1 to 10	$1 + 2 + 3 + \dots + 8 + 9 + 10$ $= (10 \times 11) \div 2$ $= 55$
Sum of numbers from 1 to 20	$1 + 2 + 3 + \dots + 18 + 19 + 20$ $= (20 \times 21) \div 2$ $= 210$
Sum of numbers from 1 to 30	$1 + 2 + 3 + \dots + 28 + 29 + 30$ $= (30 \times 31) \div 2$ $= 465$
Sum of numbers from 1 to 40	? (a)

- (a) Find the sum of numbers from 1 to 40.
- (b) The multiples of 7 and the multiples of 9 were excluded from the set of numbers 1 to 40. Find the sum of the remaining numbers in this set.

Mr. Yong uses two different square tiles, Tile A and Tile B, to tile the floor of his of his room. Both tiles are made up of 4 small squares.

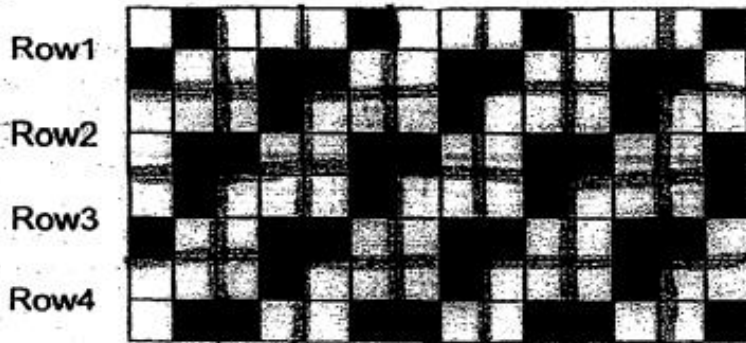


Tile A



Tile B

He lays the tiles alternately as shown in the diagram below. The first four rows of the tiled floor are shown below.



- Which tile does he use for the first tile in Row 10, Tile A or Tile B?
- He uses 105 tiles in all. How many black squares are there on his floor?