

A Maths Question, PSLE 2019

Study the pattern and answer each of the following questions.

Fig 1



Fig 2

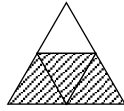


Fig 3

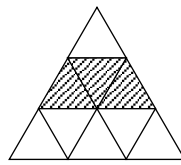


Fig 4

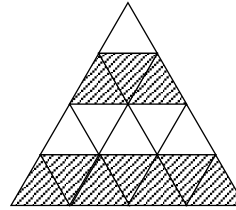


Figure	1	2	3	4	5
White triangles	1	1	6	6	15
Grey triangles	0	3	3	10	10

- a) Fill in Figure 5.
 b) What is the total number of grey triangles and white triangles for Figure 250?
 c) What percentage is grey triangles in Figure 250?

<< Pattern >>

- a) Study the pattern to find 15 white triangles and 10 grey triangles.
 b) Add the total number of triangles under the table as below.

Fig	1	2	3	4	5	6	7	8	...
White \triangle	1	1	6	6	15	15	28	28	...
Grey \triangle	0	3	3	10	10	21	21	36	...
Total	1	4	9	16	25	36	49	64	...

(Figure number)² = Total number of triangles Therefore,
 $250^2 = 250 \times 250 = 62\ 500$

Answer b) 62 500

- c) 250 is an even number. Look at the column of even number figures.
 Check the ratio of White \triangle : Grey \triangle .

Fig	1	2	3	4	5	6	7	8	...
White \triangle	1	1	6	6	15	15	28	28	...
Grey \triangle	0	3	3	10	10	21	21	36	...

	1	3	5	7

	3	5	7	9
Sequence No.	①	②	③	④

The numbers for White \triangle are odd numbers starting from 1.

The numbers for Grey \triangle is always 2 more than the number for White \triangle .

Figure 250 is the 125th odd number counting from 1. Therefore,

$$1 + 2 \times (125 - 1) = 249 \quad \rightarrow \text{White at the 125}^{\text{th}} \text{ number}$$

$$249 + 2 = 251 \quad \rightarrow \text{Grey at the 125}^{\text{th}} \text{ number} \quad \therefore 249 : 251$$

$$249 + 251 = 500$$

$$251 \div 500 \times 100 = 50.2 \%$$

Answer c) 50.2%