

Patterns.

Evaluation Questions

Exercise 5(F)

1- For each pattern, given below, write the next three steps:

i- $1 \times 9 + 1 = 10$

$12 \times 9 + 2 = 110$

$123 \times 9 + 3 = 1110$

Ans- $1234 \times 9 + 4 = 11110$

$12345 \times 9 + 5 = 111110$

$123456 \times 9 + 6 = 1111110$

$555 \div 15 = 37$

$666 \div 18 = 37$

ii- $9 \times 9 + 7 = 88$

$98 \times 9 + 6 = 888$

$987 \times 9 + 5 = 8888$

Ans- $9876 \times 9 + 4 = 88888$

$9875 \times 9 + 3 = 888888$

$98765 \times 9 + 2 = 8888888$

iii- $1 \times 8 + 1 = 9$

$12 \times 8 + 2 = 98$

$123 \times 8 + 3 = 987$

Ans- $1234 \times 8 + 4 = 9876$

$12345 \times 8 + 5 = 98765$

$123456 \times 8 + 6 = 987654$

iv- $111 \div 3 = 37$

$222 \div 6 = 37$

$333 \div 9 = 37$

Ans- $444 \div 12 = 37$

2. Complete each of the following magic squares.

i-

6	7	2
1	5	9
8	3	4

Ans- Sum for row-wise is as follows:

$$6+7+2=15$$

$$1+5+9=15$$

$$8+3+4=15$$

Sum for column-wise is as follows:

$$6+1+8=15$$

$$7+5+3=15$$

$$2+9+4=15$$

Sum for diagonal-wise is as follows:

$$6+5+4=15$$

$$8+5+3=15$$

Hence, the magic square is 15

ii-

4	9	8
7	7	7
9	2	10

Ans- Sum for row-wise is as follows:

$$4+9+8=21$$

$$7+7+7=21$$

$$9+2+10=21$$

Sum for column-wise is as follows:

$$4+6+11=21$$

$$9+7+2=21$$

$$8+3+10=21$$

Sum for diagonal-wise is as follows:

$$4+7+8=21$$

$$6+7+8=21$$

Hence, the magic square is 21

11	16	2	12
	10	10	10
	16	9	4

Ans. Sum for row-wise is as follows:

$$16 + 2 + 12 = 30$$

$$10 + 10 + 10 = 30$$

$$16 + 9 + 4 = 30$$

Sum for column-wise is as follows:

$$16 + 9 + 5 = 30$$

$$2 + 10 + 18 = 30$$

$$8 + 18 + 4 = 30$$

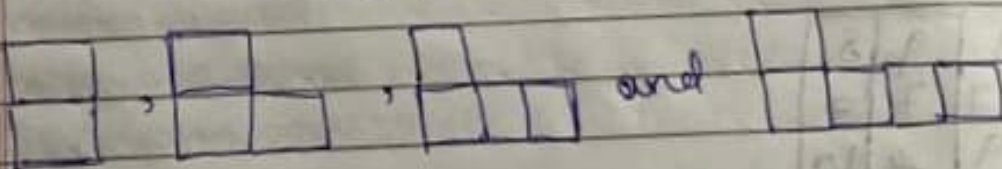
Sum for diagonal-wise is as follows:

$$16 + 10 + 4 = 30$$

$$9 + 10 + 19 = 30$$

Hence, the magic square is 30

3 See the following pattern carefully:



i- If n denotes the number of figures and S denotes the matchsticks: find S

Ans- $S = 3n + 1$

ii- Find how many matchsticks are required to make the:

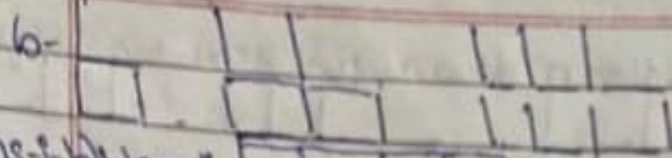
1- 15th figure 2- 40th figure

Ans- 1

iii- Write a description of the pattern for words:

Ans- It is clear that each time the figure (n) is increased by 1, the ^{number} given of matches (S) are increased by 3.

N	1	2	3	4	5
S	7	10	13	16	19

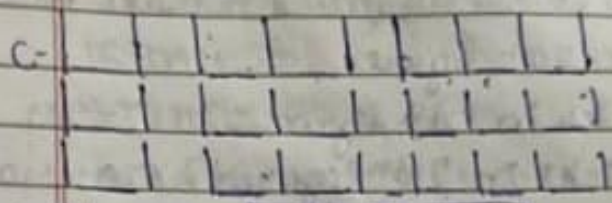


Ans-i-b) Here-

n	1	2	3
F	5	9	13

Here- F = number of matchsticks and
n = Number of figures
F in terms of n = $4n + 1$

- ii) Number of matchsticks are required for
6th figure = $4n + 1 = 4 \times 6 + 1 = 25$ matchsticks
Number of matchsticks are required for
30th figure = $4n + 1 = 4 \times 30 + 1 = 121$ matchsticks



Ans-i-c) Here- ist

n	1	2	3
F	8	13	18

Here- F = Number of matchsticks
And, here- n = Number of figures.
F in terms of n = $5n + 3$

- ii) Number of matchsticks are required
for 16th figure = $5n + 3 = 5 \times 16 + 3 = 80 + 3 = 83$ matchsticks.
Number of matchsticks are required
for 30th figure = $5n + 3 = 5 \times 30 + 3 = 153$ matchsticks



Ans-i-d) Here- F = Number of matchsticks

n	1	2	3
F	8	11	16

n = Number of figures.
F in terms of n = $5n + 1$

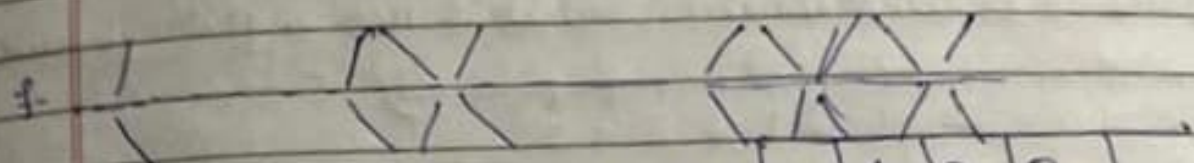
- ii) Number of matchsticks required for 16th
figure = $5n + 1 = 5 \times 16 + 1 = 81$ matchsticks
Number of matchsticks required for 30th
figure = $5n + 1 = 5 \times 30 + 1 = 151$ matchsticks

Ans-i-e)	F = Number of matchsticks	n	1	2	3					
	n = Number of figures	F	5	9	13					

And here, F in the terms of n = $4n+1$

ii-) Here, number of matchsticks required for 16th figure = $4n+1 = 4 \times 16 + 1 = 65$ matchsticks

Number of matchsticks required for 30th figure = $4n+1 = 4 \times 30 + 1 = 121$ matchsticks



Ans-f-e)	F = Number of matchsticks	n	1	2	3
	n = Number of figures	F	2	6	10

Here, F in the terms of n = $4n-2 = 4n-2$

ii) Number of matchsticks required for 16th figure = $4n-2 = 4 \times 16 - 2 = 62$ matchsticks

Number of matchsticks required for 30th figure = $4n-2 = 4 \times 30 - 2 = 118$ matchsticks.