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NATURAL NUMBERS AND WHOLE NUMBERS

Learning Outcomes

Students will attempt to solve questions involving patterns.

Previous knowledge test

1. Does there exist a number such that $a \div a = a$?

Solution

Yes and the number a is 1

$a \div a = a$

$1 \div 1 = 1$

$51 \div 51 = 1$

2. Divide 5936 by 43 to find the quotient and remainder. Also, check your division by using the formula. dividend = divisor × quotient + remainder

Q2 3)

Evaluation Question

2. Complete each of the following magic squares

i)

6	7	2
	5	
1	5	9
8	3	4

ii)

4	9	8
11	7	3
6	5	10

iii)

4	2	D
C	10	M
8	B	9

Evaluation Question

i) 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+5+4 = 15

7+5+3 = 15

(ii) Row wise sum is as follows.

4+9+8=21

11+7+3=21

6+5+10=21

Colom wise sum is as follows

4+11+6=21

9+7+5=21

8+3+10=21

Diagonal wise sum is as follows

4+7+10=21

8+7+6=21

Hence the magic square is

(iii) Row wise sum is as follows

16+2+12=30

6+10+14=30

8+18+4=30

Column wise sum is as follows

16 + 6 + 8 = 30

2 + 10 + 8 = 30

12 + 9 + 9 = 30

Diagonal wise sum is as follows

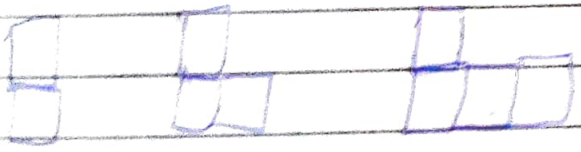
16 + 10 + 4 = 30

11 + 10 + 8 = 30

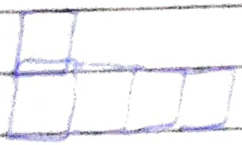
Hence, the magic square is

Evaluation Question

1. See the following pattern carefully:



and



Here denotes the number of figures and denotes the number of matchsticks

i) Find S in terms of n

ii) Find how many matches are needed to make the

Evaluation Question

1. 15th figure

2. 10th figure

iii) Write a description of the pattern

Words.

Solution:

The Table is

S: 3n+4

15th figure has: 3×15+4

=49 matches

2. 10th Figure has: 3×40+4

=124 matches

iii) It is clear that each time the

... as 'n' is increased by 4, the number of ... when 'a' are increased by 2

A	1	5	9
a	4	[illegible]	[illegible]

Evaluation Question

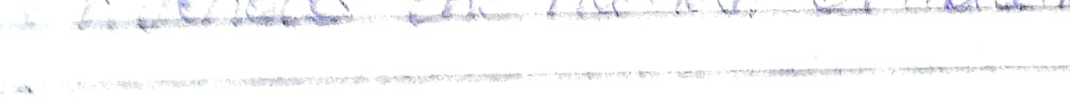
In the following pattern, draw next ... figures

construct a table to describe the figures ... the above pattern

... denotes the number of matchsticks

How many matchsticks are ... required to make the ... figure

... figure



Evaluation Question

(i) 

N	1	2	3	4	5
S	2	4	6	8	10

(ii) The table is given above

(iii) Hence, the value of L is

$L = 2n$

(iv) (a) Number of matchsticks in 12th figure = $2 \times 12 = 24$

(b) Number of matchsticks in 20th figure = $2 \times 20 = 40$

5. In each of the following patters, constru the next figure

(i) In each case, If n denotes the numbe of figures and F denotes the number of matchsticks used, find F in terms of

(ii) Also find, in each case, how many matchsticks are required to make the 10th figure and 30th figure.

$3n+2$

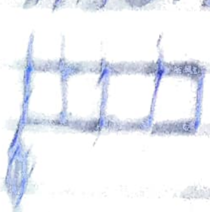
$3\times4+2$

$=14$

$f=3n+2$

$3\times10+2$ So

$3\times30+2=92$

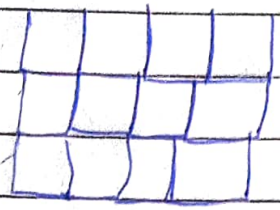


$4n+1$

$4\times4+1=17$

(i) $4 \times 16 + 1 = 65$

$4 \times 30 + 1 = 121$

c 

Ans) $5n + 3$

$= 5 \times 4 + 3$

$= 23$

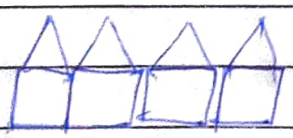
(ii) $5n + 3$

$= 5 \times 16 + 3$

$= 83$

$5 \times 30 + 3$

$= 153$

d 

$5n + 17$

$= 5 \times 4 + 1 = 21$

50 ÷ 17

= 5 × 16 ÷ 17

= 81

5 × 30 ÷ 17

= 15

E 

(iii) 96 ÷ 17

9 × 1 ÷ 17

= 17

(i) 96 ÷ 17

= 9 × 16 ÷ 17

= 61 ÷ 17

= 61

9 × 30 ÷ 17

120

= 121