***INTERNATIONAL INDIAN SCHOOL***

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Worksheet For The Academic Year 2025-26

**CLASS: VI SUBJECT: Mathematics DATE: 11/05/2025**

**LESSON-1 Patterns in Mathematics**

1) The branch of mathematics that studies patterns in whole numbers is called Number Theory.

2) The number sequence represented by I , 3 , 5 , 7 ,…… represents odd numbers.

3) When we add the consecutive odd numbers starting from 1 we get square numbers.

4) Equilateral triangle and square are called regular polygons.

5) The word 'regular' used in polygons mention equal sides and angles.

6) A regular hexagon has 6 equal sides.

7) The next number in the triangular sequence 1 , 3 , 6 , 10 ,…. is 15.

8) The sequence 1 , 2 , 4 , 8 , 16 ,…. is called powers of 2.

9) The characteristic of square numbers can be visualised as dots in the form of a square grid.

10) What is Virahanka sequence?

A sequence of numbers in which each number in the sequence except one is the sum of the two preceeding counting numbers is called Virahanka numbers.

11) What is the fifth shape in a pattern when we start with a triangle and the number of sides increase by one each time?

Heptagon (7 sided polygon)

12) Visualise the square number 49 using dots.

Use dots and represent it.

13) What are hexagonal numbers? Represent the first three numbers in the sequence pictorially.

Ans) Hexagonal numbers can be visualised in the form of a hexagon by using dots where the central row consists of odd number of dots. The first three numbers in the sequence are: 1 , 7 , 19.

Show these pictorially using dots.

14) Identify the pattern and write the next three numbers to complete the given pattern: a) 1, 3, 6, 10, 15, ……

Ans) It is triangular number sequence.

1

1 + 2 = 3

1 + 2 + 3 = 6

1 + 2 + 3 + 4 = 10

1 + 2 + 3 + 4 + 5 = 15

So the next three numbers in the sequence are : 21 , 28 , 36.

b) 1 , 8 , 27 , 64 , 125 , ……..

Ans) These are cube numbers.

$1^3 = 1$

$2^3 = 8$

$3^3 = 27$

$4^3 = 64$

$5^3 = 125$

So the next three numbers in the sequence are :

$6^3 = 216$ , $7^3 = 343$ , $8^3 = 512$.

15) Find the $10^{th}$ member of the sequence: 1 , 3 , 5 , 7 , ……

Ans) 19

16) What sequence is 1, 4 , 9 , 16 , 25 , ……?

Ans) Square number sequence.

17) Find the rule used in the sequence: 3 , 12 , 48 , ……..

Ans) The next number is 4 times the preceeding number.

18) Form a sequence by adding two consecutive even number and then minus one.

Ans) $0 + 2 = 2$ , $2 - 1 = 1$

$2 + 4 = 6$ , $6 - 1 = 5$

$4 + 6 = 10$ , $10 - 1 = 9$

$6 + 8 = 14$ , $14 - 1 = 13$

$8 + 10 = 18$ , $18 - 1 = 17$

So the sequence is 1 , 5 , 9 , 13 , 17 , …….

19) Create a pattern using the rule 'Add 5 to the previous number starting with 3'.

Ans) 3 , 8 , 13 , 18 , 23 , 28 , …….

20) What sequence do we get if we add the consecutive odd numbers starting with one? Show the steps used.

Ans) 1

$1 + 3 = 4$

$1 + 3 + 5 = 9$

$1 + 3 + 5 + 7 = 16$

So we get the sequence of square numbers.

21) Express the first three triangular numbers pictorially using dots.

Ans) Represent 1 , 3 , 6 using dots

22) How can we represent square numbers adding uo and down? Show five numbers in the sequence.

Ans) 1 ($1^2$ )

$1 + 2 + 1 = 4$ ($2^2$ )

$1 + 2 + 3 + 2 + 1 = 9$ ($3^2$ )

$1 + 2 + 3 + 4 + 3 + 2 + 1 = 16$ ($4^2$ )

$1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1 = 25$ ($5^2$ )

23) Draw a pentagon.

24) Find the value of :1 + 2 + 3 + …… + 24 + 25 + 24 + ….. + 3 + 2 + 1

Ans) $25^2 = 625$

25) Write the next three numbers in the number of sides of Koch snowflakes sequence: 3 , 12 , 48 , …..

Ans) $48 \times 4 = 192$

$192 \times 4 = 768$

$768 \times 4 = 3072$

26) Draw stacked squares representing 16 squares.

27) Draw stacked triangles to represent 4 triangles.

28) Write the following:

a) Counting number sequence

b) Odd number sequence

c) Even number sequence

d) Square number sequence

e) Cube number sequence

f) Triangular number sequence

g) Virahanka numbers

h) Powers of 2 number sequence

i) Powers of 3 number sequence