# Identification of Patterns in Square and Triangular

# **Understanding the Topic**

- Square numbers are numbers formed by multiplying a number by itself.
- **Example:** 1 × 1 = 1, 2 × 2 = 4, 3 × 3 = 9, so 1, 4, 9 are square numbers.
- They can be shown using dot or tile patterns that form perfect square.



Triangular numbers form a triangle when arranged in dots

- They follow a pattern where each number is the sum of natural numbers in order
- Example: 1, 1+2=3, 1+2+3=6, 1+2+3+4=10, 1+2+3+4+5=15 so
  1, 3, 6, 10, 15 are triangular numbers
- Recognizing these patterns helps in solving bigger math problems and improves logical thinking



# **Important Points to Remember**

- Square numbers grow by adding odd numbers in order (1, 3, 5, 7...)
- Triangular numbers grow by adding the next natural number each time.
- Both patterns are helpful in geometry and number games.
- These patterns can also be seen in tiles, staircases, and dot designs.
- The  $n^{th}$  square number is  $n \times n$ .
- The n<sup>th</sup> triangular number is  $n \times \frac{n+1}{2}$ .

# **Examples with Solutions**

1. Easy Square Number

Question: What is the square of 5

Solution: 5 × 5 = 25. So, 25 is a square number

2. Finding Triangular Number

Question: What is the 4th triangular number

**Solution:** 1 + 2 + 3 + 4 = 10. So, 10 is the 4th triangular number

3. Using Formula for Triangular Numbers

Question: Find the 6th triangular number using formula

**Solution:**  $6 \times \frac{6+1}{2} = 6 \times \frac{7}{2} = \frac{42}{2} = 21$ 

4. Spot the Pattern

Question: What comes next in the pattern 1, 4, 9, 16

Solution: These are square numbers. Next is 5 × 5 = 25

5. Match the Pattern

Question: Which number fits the triangular pattern: 1, 3, 6, 10, \_\_\_\_

Solution: Add 5 to the last number. 10 + 5 = 15

#### **Summary Points**

- Square numbers follow n × n and grow quickly
- Triangular numbers follow  $n \times \frac{n+1}{2}$  and grow step-by-step
- Patterns can be seen in dot arrangements, tiles, and math puzzles
- These number patterns improve number sense and mental math
- Understanding these patterns helps in higher classes and logical thinking