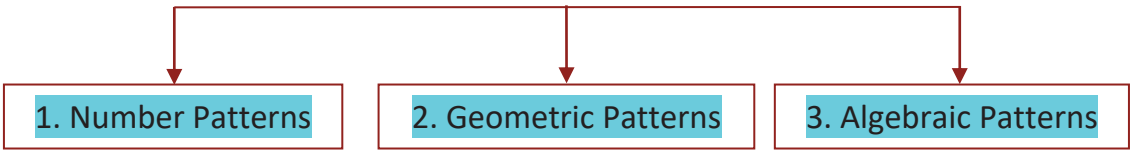
Patterns in Mathematics

Introduction to Patterns in Mathematics

Patterns in mathematics are arrangements of numbers, shapes, or symbols that follow a specific rule or sequence. These patterns help us identify relationships, make predictions, and understand mathematical concepts easily.

Types of Patterns

Mathematical patterns can be broadly classified into three types:



1. Number Patterns

Number patterns are sequences of numbers that follow a particular rule.

Example 1: Increasing Pattern

Pattern: 2, 4, 6, 8, 10, …

Rule: Add 2 to each previous number.

Example 2: Decreasing Pattern

Pattern: 100, 90, 80, 70, …

Rule: Subtract 10 from each previous number.

Example 3: Multiplication Pattern

Pattern: 3, 6, 12, 24, 48, …

Rule: Multiply by 2 each time.

2. Geometric Patterns

Geometric patterns involve shapes or figures arranged in a repeated or symmetrical way.

Example 1: Shape Pattern

Rule: Repeating sequence of a circle and a triangle.

Example 2: Increasing Shapes

Rule: The number of triangles increases by one in each step.

3. Algebraic Patterns

Algebraic patterns use variables to define a sequence or rule.

Example: If a number is represented by n, then:

Pattern: n, n + 2, n + 4, n + 6, …

For n = 3, the pattern becomes: 3, 5, 7, 9, 11, …

Rule: Add 2 to each term.

Properties of Patterns

i. **Predictability –** Patterns help in guessing the next element.

ii. **Repetition –** Patterns repeat after a certain number of steps.

iii. **Logical Rule** – Every pattern follows a specific mathematical or visual rule.

iv. **Symmetry** – Some patterns have mirror-like symmetry.

v. **Growing or Shrinking** – Some patterns increase or decrease in size or number.