Board –F-7	Class – 7th	Topic – Perimeter and Area: Detailed Theory

Introduction

Understanding **perimeter** and **area** is essential in geometry. These concepts help us measure the boundaries and surfaces of different shapes, which are useful in real-life scenarios such as fencing a garden or painting a wall.

1 Perimeter

Definition

- **Perimeter** is the total length of the boundary of a two-dimensional figure.
- It is measured in linear units (such as centimeters, meters, or inches).

General Formula

$$\text{Perimeter} = \text{Sum of all sides}$$

Perimeter of Common Shapes

- **Rectangle:**
$$\text{Perimeter} = 2 \times (\text{Length} + \text{Breadth})$$
- **Square:**
$$\text{Perimeter} = 4 \times \text{Side}$$
- **Triangle:**
$$\text{Perimeter} = \text{Side}_1 + \text{Side}_2 + \text{Side}_3$$
- **Regular Polygon:**
$$\text{Perimeter} = \text{Number of sides} \times \text{Length of one side}$$
- **Circle (Circumference):**
$$\text{Circumference} = 2\pi r$$
where r is the radius.

2 Area

Definition

- **Area** is the amount of space enclosed within the boundary of a two-dimensional figure.
- It is measured in square units (such as square centimeters, square meters, or square inches).

Area of Common Shapes

Shape	Formula	Explanation
Rectangle	Area = Length × Breadth	Multiply length by breadth
Square	Area = Side^2	Side multiplied by itself
Triangle	Area = $\frac{1}{2}$ × Base × Height	Half of base times height
Parallelogram	Area = Base × Height	Base times perpendicular height
Trapezium	Area = $\frac{1}{2}$ × (Sum of parallel sides) × Height	Average of parallel sides times height
Circle	Area = πr^2	Pi times radius squared

3 Key Points

- **Perimeter** is always a linear measurement; **area** is always a square measurement.
- When calculating area, always ensure all measurements are in the same unit.
- For irregular shapes, break them into regular shapes, find the area of each, and add them together.

4 Units

Measurement	SI Unit	Other Common Units
Perimeter	Meter (m)	Centimeter (cm), Inch (in), Foot (ft)
Area	Square meter (m^2)	Square centimeter (cm^2), Square inch (in^2), Square foot (ft^2)

5 Important Tips

- Always write the formula before substituting values.
- Double-check units before finalizing your answer.
- For composite shapes, calculate each part separately and then combine results.