Mensuration - Class 8 Study Material

Chapter 11: Mensuration

Based on NCERT Curriculum

1. Introduction

Mensuration is the branch of mathematics that deals with measurement of shapes and objects, including their lengths, areas, and volumes. It is used in real life for tasks such as finding the area of land, volume of containers, and surface area of objects.

This chapter focuses on:

- Area of trapezium, general quadrilateral, and polygons

- Surface area and volume of cuboid and cube

- Unit conversions for area and volume

2. Area of Plane Figures

2.1 Trapezium

A trapezium has one pair of parallel sides.

Formula:
Area = 1/2 × (a + b) × h
where:
a and b = lengths of the parallel sides
h = height (distance between them)

Any quadrilateral can be divided into two triangles.

Formula:
Area = 1/2 × diagonal × (height1 + height2)

Polygons like pentagons and hexagons can be broken into triangles or trapeziums. Find the area of each part and add them to get total area.

3. Surface Area of Solids

3.1 Cuboid

Lateral Surface Area = 2 × (length + breadth) × height

Total Surface Area = 2 × (length × breadth + breadth × height + height × length)

Lateral Surface Area = 4 × side²

Total Surface Area = 6 × side²

4. Volume of Solids

4.1 Cuboid

Volume = length × breadth × height

Volume = side × side × side ($side^3$)

5. Units and Conversions

Quantity	Units	Conversion
Length	cm, m	1 m = 100 cm
Area	cm^2, m^2	1 m^2 = 10,000 cm^2
Volume	cm^3, m^3	1 m^3 = 1,000,000 cm^3

6. Real-Life Applications

- Estimating floor area of rooms
- Finding volume of water tanks
- Measuring paint needed for walls
- Designing tiles or garden plots

7. Solved Example

Q: Find the area of a trapezium with parallel sides 10 cm and 6 cm, and height 5 cm.

Solution:
Area = 1/2 × (10 + 6) × 5 = 1/2 × 16 × 5 = 40 cm^2

8. Tips for Practice

- Learn and revise all formulas regularly
- Convert units to the same system before solving
- Understand the difference between area and volume
- Solve all NCERT examples and exercises

Conclusion

Mensuration helps in solving many practical problems in daily life. With a good understanding of formulas and practice, students can master this topic easily.