📘 Formulas You Should Know

1. Cuboid

- **Surface Area** = $2(lw + lh + wh)$
- **Volume** = $l \times w \times h$

2. Prism (Any shape with a uniform cross-section)

- **Volume** = Area of cross-section × length
- **Surface Area** = 2 × Area of cross-section + Perimeter of cross-section × length

3. Cylinder (a circular prism)

- **Curved Surface Area** = $2\pi rh$
- **Total Surface Area** = $2\pi rh + 2\pi r^2$
- **Volume** = $\pi r^2 h$

4. Sphere

- **Surface Area** = $4\pi r^2$
- **Volume** = $(4/3)\pi r^3$

5. Cone

- **Curved Surface Area** = πrl
- **Total Surface Area** = $\pi rl + \pi r^2$
- **Volume** = $(1/3)\pi r^2 h$
- *(l = slant height)*

6. Pyramid

- **Volume** = (1/3) × base area × height
- **Surface Area** = base area + sum of area of triangular faces

Examples

Example 1: Volume of a Cuboid

A cuboid has dimensions 5 cm × 3 cm × 2 cm.

Volume = 5 × 3 × 2 = **30 cm³**

Example 2: Surface Area of a Cylinder

A cylinder has radius = 4 cm and height = 10 cm.

Curved surface area = $2\pi rh = 2\pi \times 4 \times 10 = \mathbf{80\pi\ cm^2}$

Total surface area = $80\pi + 2\pi(4^2) = 80\pi + 32\pi = \mathbf{112\pi\ cm^2}$

Example 3: Volume of a Sphere

A sphere has radius = 6 cm.

Volume = $(4/3)\pi(6^3) = (4/3)\pi(216) = \mathbf{288\pi\ cm^3}$

Example 4: Surface Area of a Cone

A cone has radius = 3 cm and slant height = 5 cm.

Curved surface area = $\pi \times 3 \times 5 = \mathbf{15\pi\ cm^2}$

Total surface area = $15\pi + \pi \times 3^2 = 15\pi + 9\pi = \mathbf{24\pi\ cm^2}$

Example 5: Volume of a Pyramid

A square-based pyramid has base side = 6 cm and height = 10 cm.

Base area = $6^2 = 36\ cm^2$

Volume = $(1/3) \times 36 \times 10 = \mathbf{120\ cm^3}$

Example 6: Volume of a Prism

A triangular prism has base area = 20 cm^2 and length = 12 cm.

Volume = 20 × 12 = **240 cm^3**