

Solids (Surface Area and Volume of 3-D Solids)

Chapter 21: Solids (Surface Area and Volume of 3-D Solids) · Topic 1

Key Concept

A cylinder's volume is $\pi \times \text{radius}^2 \times \text{height}$, and its curved surface area is $2 \times \pi \times \text{radius} \times \text{height}$.

A sphere's volume is $(4/3) \times \pi \times \text{radius}^3$, and its surface area is $4 \times \pi \times \text{radius}^2$.

A cone's volume is $(1/3) \times \pi \times \text{radius}^2 \times \text{height}$, useful for calculating the capacity of cone-shaped containers.

These formulas are used in real life for tasks like calculating water tank capacity, packaging material needed, or container sizes.

Quick Revision Notes

- Cylinder volume = $\pi \times \text{radius}^2 \times \text{height}$.
- Cylinder curved surface area = $2 \times \pi \times \text{radius} \times \text{height}$.
- Sphere volume = $(4/3) \times \pi \times \text{radius}^3$.
- Sphere surface area = $4 \times \pi \times \text{radius}^2$.
- Cone volume = $(1/3) \times \pi \times \text{radius}^2 \times \text{height}$.
- These formulas apply to real-world capacity problems.
- Examples: water tanks, packaging, containers.
- Practice builds solid geometry problem-solving skills.

Practice Questions

- 1 Calculate the volume of a cylinder with radius 4cm and height 10cm.
- 2 Calculate the surface area of a sphere with radius 5cm.
- 3 Calculate the volume of a cone with radius 3cm and height 9cm.
- 4 Discuss a real-life use of these formulas.
- 5 Solve two solid geometry problems.
- 6 Research the capacity of a real container.