

Volume of Solids

Chapter 11: Surface Areas and Volumes · Topic 2

Key Concept

A useful relationship to remember is that a cone's volume is always exactly one-third of a cylinder's volume when both share the same base radius and height — this can even be demonstrated experimentally by filling a cone-shaped container with water or sand and pouring it into a same-sized cylinder exactly three times to fill it. These volume formulas are essential for practical calculations, from determining how much liquid a container can hold to calculating the amount of concrete needed for construction.

Quick Revision Notes

- Cube volume: side^3 . Cuboid volume: $\text{length} \times \text{breadth} \times \text{height}$.
- Cylinder volume: $\pi r^2 h$. Cone volume: $(1/3)\pi r^2 h$ (one-third of a same-sized cylinder).
- Sphere volume: $(4/3)\pi r^3$.
- A cone's volume is always exactly $1/3$ of a cylinder's volume sharing the same base and height.

Practice Questions

- 1 Find the volume of a cylinder with radius 7cm and height 10cm.
- 2 Calculate the volume of a cone with the same radius and height as the above cylinder, verifying it is one-third.
- 3 Find the volume of a sphere with radius 3cm.