Surface Areas and Volumes

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Class 9

Comprehensive study notes for

Surface Areas and Volumes

by

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(Math King of Katargam). Master every concept with clear explanations, solved examples, and practice problems.

Key Concepts

Cube

A

cube

has 6 equal square faces. Lateral Surface Area (LSA) = 4a2. Total Surface Area (TSA) = 6a2. Volume = a3 where a = edge length.

Cuboid

A

cuboid

has 6 rectangular faces. LSA = 2h(l+b). TSA = 2(lb + bh + hl). Volume = l x b x h.

Right Circular Cylinder

LSA (Curved Surface Area) = 2?rh. TSA = 2?r(r+h). Volume = ?r2h.

Right Circular Cone

Slant height l = ?(r2 + h2). CSA = ?rl. TSA = ?r(r+l). Volume = (1/3)?r2h.

Sphere and Hemisphere

Sphere:

CSA = TSA = 4?r2. Volume = (4/3)?r3.

Hemisphere:

CSA = 2?r2. TSA = 3?r2. Volume = (2/3)?r3.

Important Formulas

Cube

TSA = 6a2, V = a3

Cuboid

TSA = 2(lb+bh+hl), V = lbh

Cylinder

CSA = 2?rh, TSA = 2?r(r+h), V = ?r2h

Cone

l = ?(r2+h2), CSA = ?rl, V = (1/3)?r2h

Sphere

CSA = TSA = 4?r2, V = (4/3)?r3

Hemisphere

CSA = 2?r2, TSA = 3?r2, V = (2/3)?r3

Solved Examples

Example 1:

Find the TSA and volume of a cube with edge 5 cm.

Solution:

TSA = 6 x 52 = 150 cm2. Volume = 53 =

125 cm3

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Example 2:

Find the volume of a cylinder with radius 7 cm and height 10 cm.

Solution:

V = ?r2h = (22/7) x 49 x 10 =

1540 cm3

.

Example 3:

Find the surface area of a sphere with radius 7 cm.

Solution:

TSA = 4?r2 = 4 x (22/7) x 49 =

616 cm2

.

Practice Questions

Find the LSA of a cuboid with dimensions 8 cm, 6 cm, 5 cm.

A cylindrical tank has radius 3.5 m and height 10 m. Find its capacity in litres.

Find the slant height of a cone with radius 6 cm and height 8 cm.

The volume of a sphere is 4851 cm3. Find its radius.

How many litres of water can a hemispherical bowl of radius 21 cm hold?

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