Class 10 Mathematics – Chapter: Surface Areas and Volumes

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1. Introduction

This chapter deals with calculating surface areas and volumes of 3D solids like cubes, cuboids, cylinders, cones, spheres, and hemispheres.

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2. Surface Area Formulas

Solid	Surface Area Formula
Cube	6a26a^26a2
Cuboid	2(lb+bh+hl)2(lb + bh + hl)2(lb+bh+hl)
Cylinder	2πr(h+r)2\pi r(h + r)2πr(h+r)
Cone	πr(l+r)\pi r (l + r)πr(l+r), where l=h2+r2l = \sqrt{h^2 + r^2} l=h2+r2
Sphere	4πr24\pi r^24πr2

Hemisphere	3πr23\pi r^23πr2

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3. Volume Formulas

Solid	Volume Formula
Cube	a3a^3a3
Cuboid	lbhlbhlbh
Cylinder	πr2h\pi r^2 hπr2h
Cone	13πr2h\frac{1}{3}\pi r^2 h31πr2h
Sphere	43πr3\frac{4}{3}\pi r^334πr3
Hemisphere	23πr3\frac{2}{3}\pi r^332πr3

4. Important Notes

- aaa = side of cube
- l,b,hl, b, hl,b,h = length, breadth, height of cuboid
- r,h,lr, h, lr,h,l = radius, height, slant height of cylinder/cone
- Use π=227\pi = \frac{22}{7}π=722 or 3.14 as per question

5. Tips for Exam

- Write formulas clearly before solving.
- Convert all units to the same system.
- Practice converting between surface areas and volumes.
- Draw figures when possible to visualize.