CBSE Class 09 Mathematics
Revison Notes
CHAPTER 13
SURFACE AREAS AND VOLUMES

1. Surface Area of a Cuboid and a Cube
2. Surface Area of a Right Circular Cylinder
3. Surface Area of a Right Circular Cone
4. Surface Area of a Sphere
5. Volume of a Cuboid
6. Volume of a Cylinder
7. Volume of a Right Circular Cone
8. Volume of a Sphere

Cuboid - with length l, breadth b and height h

Perimeter of Cuboid = $4\left(l + b + h\right)$

Length of diagonal = $\sqrt{l^2 + b^2 + h^2}$

Lateral surface area = $2h\left(l + b\right)$

Total surface area = $2\left(lb + bh + hl\right)$

Volume = lbh

Cube - with side a

Perimeter of cube = 12 x edge

Lateral surface area = $4a^2$

Total surface area = $6a^2$

Volume = a^3

Right Prism

Lateral Surface area = Perimeter of base x Height

Total surface area = Lateral Surface area + 2(Area of one end)

Volume = Area of base x Height

Right Circular Cylinder - with radius r and height h

Curved Surface area = $2\pi rh$

Total surface area = $2\pi r\left(r+h\right)$

Volume = $\pi r^2 h$

Hollow Cylinder

Each base surface area = $\pi\left(\mathrm{R}^2 - r^2\right)$

Curved surface area = $2\pi h\left(\mathrm{R} + r\right)$

Total surface area = $2\pi\left(\mathrm{R} + r\right)\left(h + \mathrm{R} - r\right)$

Volume = $\pi h\left(\mathrm{R}^2 - r^2\right)$

Right Pyramid

Lateral Surface area = $\frac{1}{2}$ x Perimeter of base x Slant Height

Total surface area = Lateral Surface area + Area of base

Volume = $\frac{1}{3}$ x Area of base x Height

Right Circular Cone - with with radius r, height h and slant height l

A right circular cone is a solid generated by revolving a line segment which passes through a fixed point and which makes a constant angle with a fixed line. The fixed point is called the

vertex of the cone, the fixed line is called the axis of the cone.

Curved Surface area = $\pi r l$

Total surface area = $\pi r \left(l + r\right)$

Volume = $\frac{1}{3} \pi r^2 h$

Volume = $\frac{1}{3}$ x Area of the base x height

Sphere (Solid) - with radius r

The set of all points in space which are equidistant from a fixed point is called a sphere. The fixed point is called the centre of the sphere and the constant distance is called its radius.

Curved Surface Area = $4\pi r^2$

Total surface area = $4\pi r^2$

Volume = $\frac{4}{3} \pi r^3$

Hemisphere - with radius r

Curved Surface Area = $2\pi r^2$

Total surface area = $3\pi r^2$

Volume = $\frac{2}{3} \pi r^3$

Spherical shell - with inner with radius r and outer radius R

Volume = $\frac{4}{3} \pi \left(\mathrm{R}^3 - r^3\right)$