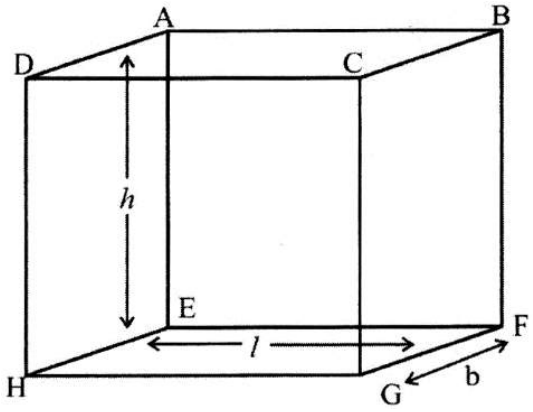
Surface Areas and Volumes

NOTES

FUNDAMENTALS

- **Cuboid:-** A cuboid is a solid bounded by the rectangular plane regions. A cuboid has six faces, 12 edges and 8 vertices.

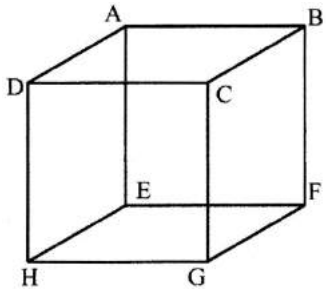
Total surface Area of the cuboid $= 2(lb + bh + hl)$ sq. units.



Volume of the cuboid $= l \times b \times h$

Diagonal of the cuboid $= \sqrt{l^2 + b^2 + h^2}$

- A cuboidal whose length, breadth and height are equal is called a cube.



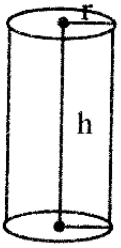
If length of each edge of a cube is a,

Then, volume of the cube $= a^3$

Total surface area of the cube $= 6a^2$

Diagonal of the cube $= \sqrt{3}a.$

- **Cylinder:-** It is formed by rotating one side of a rectangle about its opposite side.



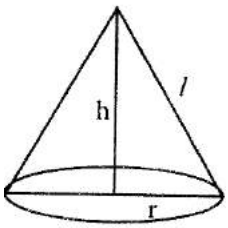
Volume of the cylinder $= \pi r^2 h$

Area of the base $= \pi r^2$

Area of the curved surface $= 2\pi rh$

Total surface Area $= 2\pi rh + 2\pi r^2 h = 2\pi r(h + r)$

- **Right Circular Cone:-** A right circular cone is a solid generated by a right angled triangle around its height.



Radius = r. Height = h

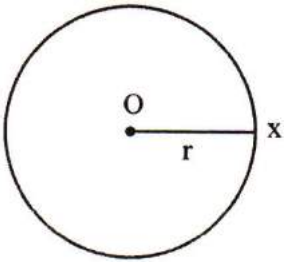
Slant height = 1

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

Area of the Base $= \pi r^2$

Area of the curved surface $= \pi r\sqrt{h^2 + r^2} = \pi rl$

- **Sphere:-** The set of all points in the space which are equidistant from fixed j3omt is called a sphere.

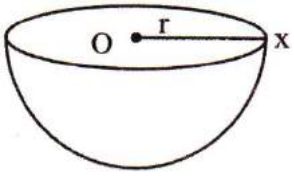


OX = Radius = r

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

Surface Area of a sphere $= 4\pi r^2$

- **Hemisphere:-** A plane through the centre of the sphere divides the sphere into two equal parts each of which is called a hemisphere.



Radius = OX = r

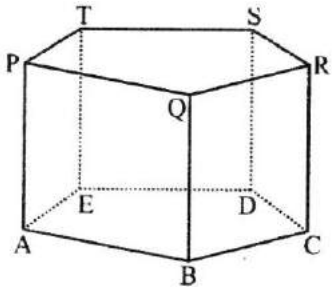
Volume of a Hemisphere $\frac{2}{3}\pi r^3$

Curved surface area of a Hemisphere = $2\pi r^2$

Total surface area of a Hemisphere = $3\pi r^2$

- **Prism:-** Volume of Right prism $= Area\ of\ Base \times Height.$

Lateral surface area of a prism $= perimeter\ of\ base \times Height$



- **Pyramid:-** Surface area of pyramid $= \frac{1}{2}(perimeter\ of\ base) \times Slant\ Height$

Whole surface = The slant surface + the area of the base

Volume of pyramid $= \frac{1}{2}(perimeter\ of\ base) \times Slant\ Height$