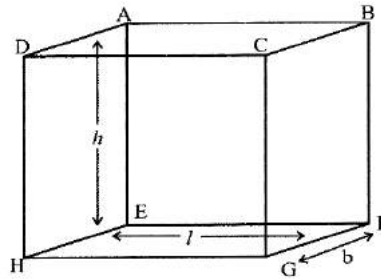


Mensuration

FUNDAMENTALS

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

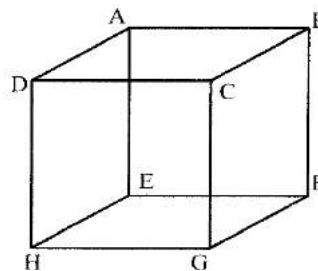
Total surface Area of the cuboid = $2(lb + bh + hl)$ sq. units.



Volume of the cuboid = $l^2 \times b \times h$

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

- **Cube:-** A cuboid whose length, breadth and height are equal is called a cube.



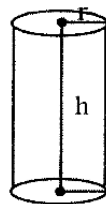
If length of each edge of a cube is a .

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 = $\pi r^2 h$

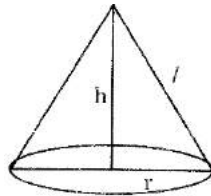
Area of the base = πr^2

Area of the curved surface = $2\pi r h$

Total surface Area

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

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



Radius = r , Height = h

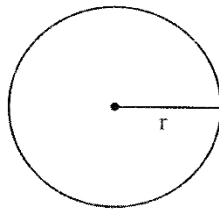
Slant height = l

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

$$\text{Area of the Base} = \pi r^2$$

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

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

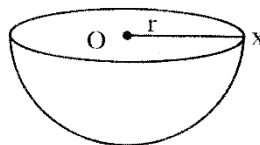


Radius = r

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

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

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



Radius = $Ox = r$

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

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

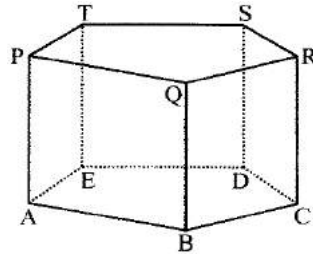
Total surface area of a Hemisphere = $37\pi r^2$

➤ **Prism:-** Volume of Right prism

= *Area of Base* \times *Height*.

Lateral surface of prism

= *Perimeter of base* \times *Height*



➤ **Pyramid:-** Surface area of pyramid

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

➤ This formula for Surface area is coming from the fact that Surface area of pyramid is nothing but sum total of areas of all its triangular faces.

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

□ Volume of pyramid

= $\frac{1}{3}(\text{Area of base}) \times \text{height}$.

