

CHAPTER 13

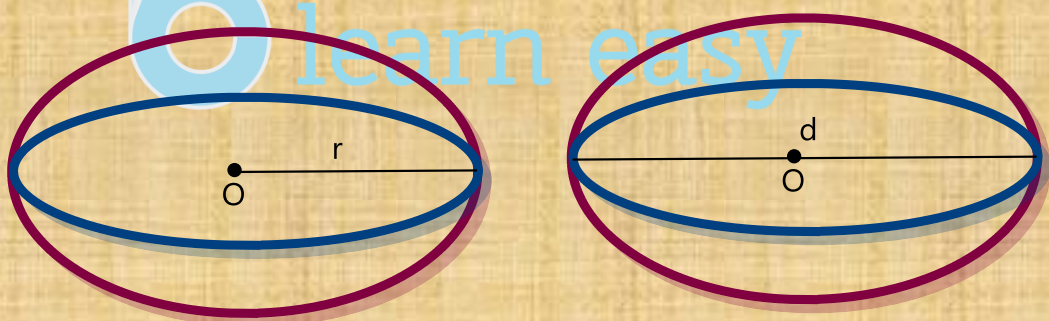
Surface areas and Volumes

Sphere:

A sphere is a figure formed by all those points in space, which are at the same distance from a fixed point.

The fixed point 'O' is called the centre of the sphere and the same distance is called the radius of the sphere.

A line segment passing through the centre of the sphere and having its end point on the sphere is called a diameter of the sphere.



Surface area of a sphere:

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

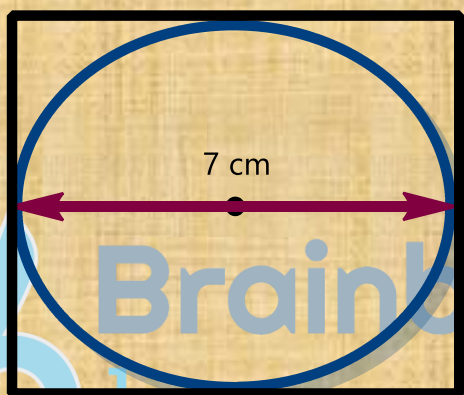
$$\text{Volume of sphere} = \frac{4}{3}\pi r^3$$

Example:

The largest sphere is curved out of a cube of side 7cm. Find the volume of the sphere.

Sol.

The diameter of the largest sphere that can be curved out of a cube of side 7 cm will be 7 cm.



$$\text{Radius of the sphere (r)} = \frac{7}{2} \text{ cm}$$

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

$$= \frac{4}{3} \times \frac{22}{7} \times \left(\frac{7}{2}\right)^3$$

$$= \frac{\cancel{4}^2}{3} \times \frac{\cancel{22}^{11}}{\cancel{7}^1} \times \frac{\cancel{7}^1}{\cancel{2}^1} \times \frac{\cancel{7}^1}{\cancel{2}^1} \times \frac{\cancel{7}^1}{\cancel{2}^1}$$

$$= \frac{49 \times 11}{3}$$

$$= \frac{539}{3}$$

Volume of the sphere = 179.67 cm^3

