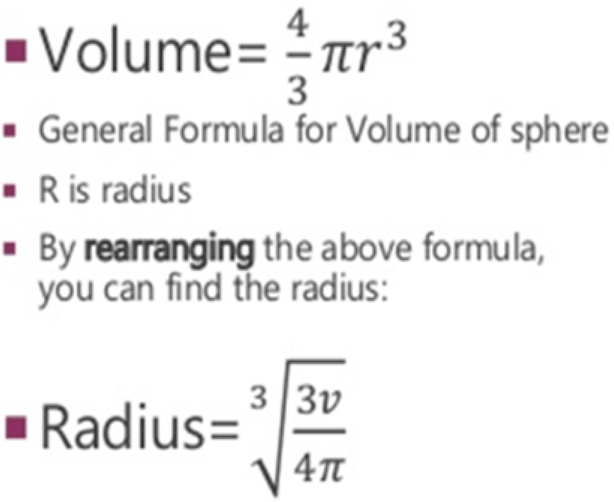
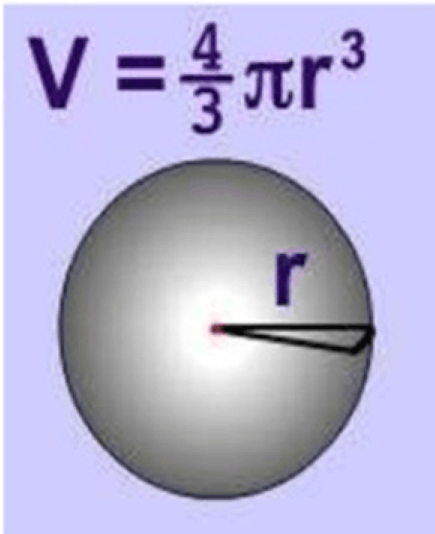
NCERT Class 9 Solutions: Surface Areas and Volumes (Chapter 13) Exercise 13.8 – Part 1





Q-1 Find the volume of a sphere whose radius is

1. $7\ cm$
2. $0.63m$

Solution:

1. Radius of the sphere $(r) = 7\ cm$

So, Volume of the sphere

- $= \frac{4}{3}\pi r^3$
- $= \left(\frac{4}{3} \times \frac{22}{7} \times 7 \times 7 \times 7\right) cm^3$
- $= \frac{4312}{3} cm^3$
- $= 1437.33 cm^2$

- Radius of the sphere $(r) = 0.63m$

Volume of the sphere

- $= \frac{4}{3}\pi r^3$
- $= \left(\frac{4}{3} \times \frac{22}{7} \times 0.63 \times 0.63 \times 0.63\right) m^3$
- $= 1.05m^3$

Q-2 Find the amount of water displaced by a solid spherical ball of diameter.

1. $28\ cm$
2. $0.21m$

Solution:

1. Spherical ball's diameter is $= 28\ cm$

Radius $= \frac{28}{2} cm = 14\ cm$

Amount of water displaced by the spherical ball = Volume of the ball

- $= \frac{4}{3}\pi r^3$
- $= \left(\frac{4}{3} \times \frac{22}{7} \times 14 \times 14 \times 14\right) cm^3$
- $= \frac{34496}{3} cm^3$
- $= 1498.66cm^3$

1. The spherical ball's diameter $= 0.21m$

Radius $(r) = \frac{0.21}{2} m = 0.105m$

Amount of water displaced by the spherical ball = Volume of the ball

- $= \frac{4}{3}\pi r^3$
- $= \left(\frac{4}{3} \times \frac{22}{7} \times 0.105 \times 0.105 \times 0.105\right) m^3$
- $= 0.004851m^3$

Q-3 The diameter of a metallic ball is $4.2\ cm$. What is the mass of the ball, if the density of the metal is $8.9g\ per\ cm^3$?

Solution:

- Diameter of the ball $= 4.2\ cm$
- Radius $= \left(\frac{4.2}{2}\right) cm = 2.1\ cm \left(\because \text{radius} = \frac{\text{diameter}}{2}\right)$

Volume of the ball

- $= \frac{4}{3}\pi r^3$
- $= \left(\frac{4}{3} \times \frac{22}{7} \times 2.1 \times 2.1 \times 2.1\right) cm^3$
- $= 38.808cm^3$

Density of the metal is $8.9g\ per\ cm^3$

Therefore, mass of the ball $= (38.808 \times 8.9)\ g = 345.3912g$