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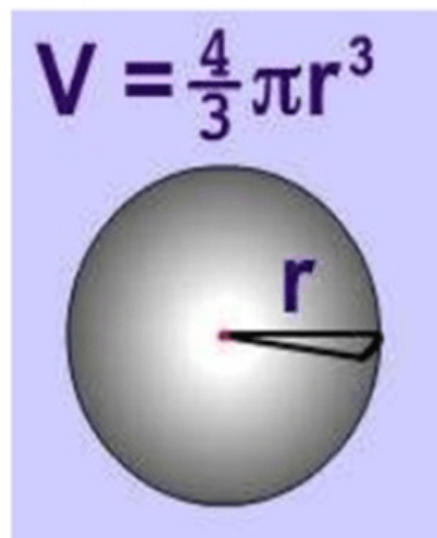
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## NCERT Class 9 Solutions: Surface Areas and Volumes (Chapter 13) Exercise 13.8 – Part 1

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- Volume =  $\frac{4}{3}\pi r^3$
- General Formula for Volume of sphere
- R is radius
- By **rearranging** the above formula, you can find the radius:

■ Radius =  $\sqrt[3]{\frac{3v}{4\pi}}$



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

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

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

Volume of the sphere

$$\begin{aligned} \bullet &= \frac{4}{3}\pi r^3 \\ \bullet &= \left(\frac{4}{3} \times \frac{22}{7} \times 0.63 \times 0.63 \times 0.63\right) m^3 \\ \bullet &= 1.05m^3 \end{aligned}$$

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

1.  $28\text{ cm}$
2.  $0.21m$

Solution:

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

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

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

$$\begin{aligned} \bullet &= \frac{4}{3}\pi r^3 \\ \bullet &= \left(\frac{4}{3} \times \frac{22}{7} \times 14 \times 14 \times 14\right) cm^3 \\ \bullet &= \frac{34496}{3} cm^3 \\ \bullet &= 1498.66cm^3 \end{aligned}$$

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

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

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

$$\begin{aligned} \bullet &= \frac{4}{3}\pi r^3 \\ \bullet &= \left(\frac{4}{3} \times \frac{22}{7} \times 0.105 \times 0.105 \times 0.105\right) m^3 \\ \bullet &= 0.004851m^3 \end{aligned}$$

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

Solution:

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

Volume of the ball

$$\begin{aligned} \bullet &= \frac{4}{3}\pi r^3 \\ \bullet &= \left(\frac{4}{3} \times \frac{22}{7} \times 2.1 \times 2.1 \times 2.1\right) cm^3 \\ \bullet &= 38.808cm^3 \end{aligned}$$

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

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