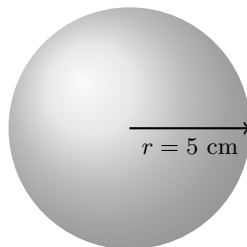


Question 4**Problem:**

A spherical balloon is being inflated so that its volume increases at a rate of $100 \text{ cm}^3/\text{s}$. How fast is the radius increasing when the radius is 5 cm ?



Question 4 - Solution

We use the formula for the volume of a sphere:

$$V = \frac{4}{3}\pi r^3$$

Differentiate both sides with respect to t :

$$\frac{dV}{dt} = 4\pi r^2 \frac{dr}{dt}$$

Substitute:

$$\frac{dV}{dt} = 100, \quad r = 5$$

$$100 = 4\pi(5)^2 \frac{dr}{dt} \Rightarrow 100 = 100\pi \frac{dr}{dt} \Rightarrow \frac{dr}{dt} = \frac{100}{100\pi} = \frac{1}{\pi}$$

Answer:

$$\boxed{\frac{dr}{dt} = \frac{1}{\pi} \text{ cm/sec}}$$