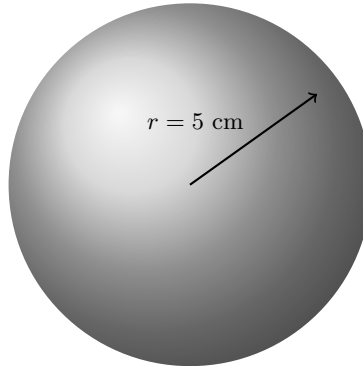


Question 2**Problem:**

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



Inflating sphere

Question 2 - Solution

We are given the volume of a sphere:

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

Differentiate both sides with respect to time t :

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

We are told that:

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

Substitute into the equation:

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

Answer:

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