

Q. If the surface area of a sphere of radius r is increasing uniformly at the rate of 8 cm²/s. Then the rate of change of its volume is.

1. proportional to r^2
2. constant
3. ✓ proportional to r
4. proportional to \sqrt{r}

$$S = 4\pi r^2$$

$$\Rightarrow \frac{dS}{dt} = 8 = 8\pi r \frac{dr}{dt}$$

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

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

$$\Rightarrow \boxed{\frac{dV}{dt} = 4r}$$