

4.1.7

$$\frac{dV}{dt} = 20 \text{ cm}^3/\text{s}, \quad r = 30 \text{ cm}.$$



$$\frac{dr}{dt} = ?$$

$$V = \frac{4}{3}\pi r^3, \quad \frac{dV}{dt} = \frac{4}{3}\pi \cdot 3r^2 \frac{dr}{dt}$$

$$\frac{dr}{dt} = \frac{dV/dt}{4\pi r^2} = \frac{20 \text{ cm}^3/\text{s}}{4\pi (30 \text{ cm})^2} = \frac{1}{180\pi} \frac{\text{cm}}{\text{s}}$$