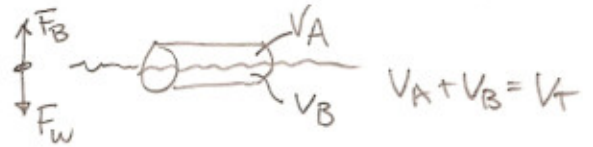


①

② $\rho_w = 400 \frac{\text{kg}}{\text{m}^3}$ $V_T = 0.5 \text{ m}^3$

$\rho_{\text{H}_2\text{O}} = 10^3 \frac{\text{kg}}{\text{m}^3}$ $\frac{V_B}{V_T} = ?$



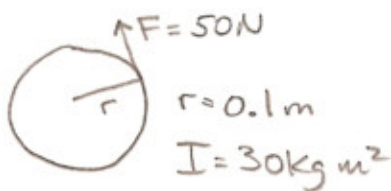
$F_B = F_w$ $\rho = \frac{m}{V}$

$\rho_{\text{H}_2\text{O}} V_B g = m g$

$\rho_{\text{H}_2\text{O}} V_B g = V_T \rho_w g$

$\frac{V_B}{V_T} = \frac{\rho_w}{\rho_{\text{H}_2\text{O}}} = \frac{400}{1000} = \boxed{0.4}$

③



$\alpha = ?$

$\tau = I \alpha = Fl$

$\alpha = \frac{Fl}{I} = \frac{(50\text{N})(0.1\text{m})}{30\text{kg m}^2}$

$\alpha = \boxed{0.17 \frac{\text{rad}}{\text{s}^2}}$

④

$\omega_0 = 0$

$\omega = \omega_0 + \alpha t$

$\omega_f = ?$

$\omega = 0 + (0.17 \frac{\text{rad}}{\text{s}^2}) 4 = \boxed{0.68 \frac{\text{rad}}{\text{s}^2}}$

$t = 4\text{s}$

⑤

$\omega_0 = 0$

$t = 4\text{s}$

$\theta = \theta_0 + \omega_0 t + \frac{1}{2} \alpha t^2$

$\theta_0 = 0$

$\theta_f = ? \frac{\text{rev}}{\text{s}}$

$\theta = \frac{1}{2} (0.17 \frac{\text{rad}}{\text{s}^2}) (16\text{s}^2) (\frac{1\text{rev}}{2\pi\text{rad}})$

$\theta = \boxed{.22\text{rev}}$

⑥

$m_e \rightarrow 2m_e$

$m_m \rightarrow 2m_m$

$r_{em} \rightarrow 3r_{em}$

$\frac{F_{\text{new}}}{F_{\text{old}}} = ?$

$F_g = G \frac{m_1 m_2}{r^2}$

$\frac{F_{\text{new}}}{F_{\text{old}}} = \frac{G \frac{2m_e 2m_m}{9r_{em}^2}}{G \frac{m_e m_m}{r_{em}^2}} = \boxed{\frac{4}{9}}$