

7. Applying Eq. 2-15 to the vertical axis (with $+y$ downward) we obtain the free-fall time:

$$\Delta y = v_{0y}t + \frac{1}{2}gt^2 \implies t = \sqrt{\frac{2(10)}{9.8}} = 1.4 \text{ s} .$$

Thus, by Eq. 11-5, the magnitude of the average angular velocity is

$$\omega_{\text{avg}} = \frac{(2.5)(2\pi)}{1.4} = 11 \text{ rad/s} .$$