

10

A ladder of length 3.5m and mass 8.22kg is held in the center by a person. What torque is required to produce an angular acceleration of $0.302 \frac{\text{rad}}{\text{s}^2}$? (Assume the ladder to be a uniform rod.)

$$I = \frac{1}{12} mL^2$$

$$\tau = I\alpha$$

$$\tau = \frac{1}{12} (8.22\text{kg}) (3.5\text{m})^2 \left(0.302 \frac{\text{rad}}{\text{s}^2} \right)$$

$$= 2.53 \text{ Nm}$$

$$\boxed{2.5 \text{ Nm}}$$