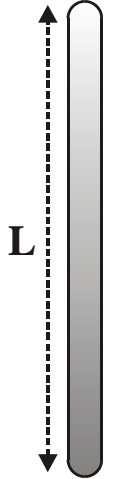


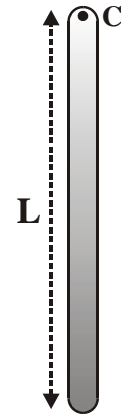
Quiz 6:4D Momentum of Inertia

A thin rod, which has a mass distribution according to $\lambda = (7.50 + 35.0 \cdot y^2) \cdot \text{kg/m}$ where $y = 0.0\text{m}$ at the top end of the rod and increases in the downward direction, is $L = 90.0\text{ cm}$.

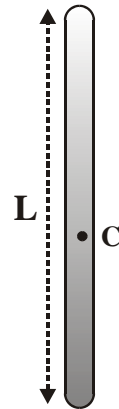
1. What is the total mass of this thin rod? [3 pts]



2. Where is the center of mass of this rod? [3 pts]



3. What is the moment of inertia of this rod about an axis through the top end of this rod? [3 pts]



4. What will be the moment of inertia about an axis through the center of mass of this rod? [3 pts]

5. A disk, which has a mass of $M = 32.0\text{ kg}$ and a radius of $R = 0.22\text{ m}$, is attached to the end of the rod. What will be the total moment of inertia of this system about a rotational center at the top end of the rod as shown? [3 pts]

