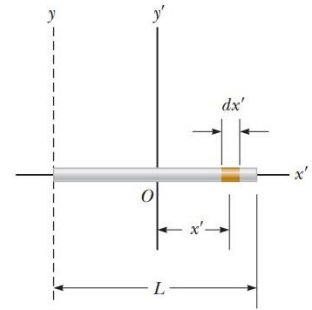1. Calculate the moment of inertia of a uniform rigid rod of length L and mass M about an axis perpendicular to the rod (the y axis) and passing through its center of mass.

2. A rod with a nonuniform mass density given by $\lambda = ax^2 + b$ is aligned on the x-axis with one end at the origin and the other end at x_0 , as shown. Calculate the moment of inertia of the rod respect to the y axis.

3. A uniform solid cylinder has a radius R, mass M, and length L. Calculate its moment of inertia about its central axis.