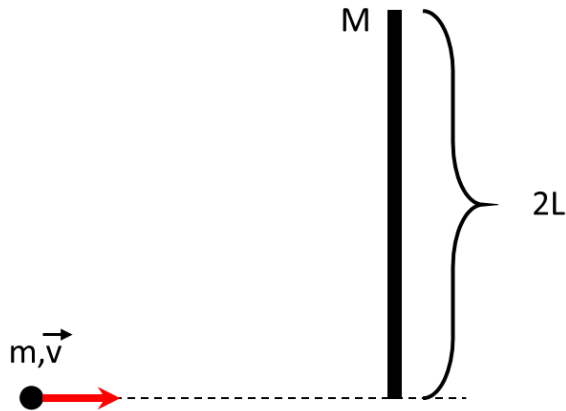Homework 4

1. A rod of mass **M** is on a frictionless table. A point object of mass **m** moving at a velocity **v** hits the rod as it is shown in the Figure below. Find the velocity of the rod's center of mass after the collision. The collision is elastic.

2. Find the angular velocity of the rod after the collision. The rotational mass of the road with respect to axis passing through its center is $1/3ML^2$.

3. At a certain ratio of the point object and rod's mass $\mu=M/m$, the rod after half turn hits the object again. Try to find this ratio.