A2) a) (5 points) A thin rod of length $2l$ and mass M lies on a frictionless plane. A ball of mass m and speed v_o strikes its end as shown. Find the final velocity of the ball, v_f, assuming that mechanical energy is conserved and that v_f is along the original line of motion.

b) (5 points) Find v_f assuming that the rod is pivoted at the lower end.