This is from the in-class angular momentum problems.

A thin rod of mass 9.0 kg and length \( d = 0.80 \text{ m} \) is pivoted at one end and can rotate without friction along a horizontal surface., and now it is initially at rest. The same piece of putty (mass = 50.0 grams) is shot at the bottom end with some speed, hits the rod and sticks to it, and now the rod plus putty swing up. When the rod and putty momentarily come to rest, the rod makes an angle of 76° with the vertical. What is the speed of the putty?