Mechanics Fall 2009, Homework 8

November 23, 2009

Hand in solutions next week (Nov 30th...)

1. **Destruction of an industrial chimney**
   At what height x_0 above the ground does a cylindrical chimney of length L and mass M break if it falls due to the force of gravity? (Note that the chimney bends around its supporting point at the ground.)

2. **Moments of Inertia**
   A thin square plate with side length a rotates at a constant angular frequency ω about an axis through the center which is tilted by an angle θ with respect to the normal to the plate. (i) Find the principle moments of inertia. (ii) Calculate the angular momentum in the intertial system. (iii) Calculate the torque on the axis.