Mechanics

8. A pendulum consists of a mass m attached to a light (massless!) rigid rod of length ℓ which is free to move in a vertical plane and such that the pivot point A of the rod is forced to move vertically, its distance from a fixed point O, being a given function of time, $\gamma(t)$.

   (a) How many generalized coordinates are needed to discribe the motion?

   (b) What is the Lagrangrian of the system? Write down the Lagrange equations of motion.