A particle with mass m is suspended in a uniform gravitational field by a massless rod of length l such that it can move in a plane. A second particle of mass m is attached to the first particle by a massless rod of length l with a pivot that allows it to move in the same plane as the first particle. At the pivot there is a torsional spring with the torque given by $\tau = -\kappa\gamma$, where γ is the angle between the axes of the rods and κ is a constant.

Write the Lagrangian for this system and obtain the equations of motion for the two particles.