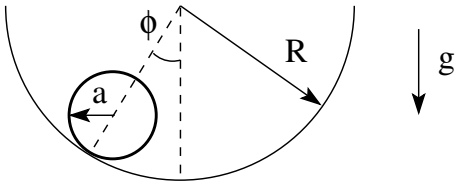
[mex178] Rolling pendulum

Consider a homogeneous cylinder of mass m and radius a rolling on the inside of a cylindrical surface with radius R. The cylinder axes are horizontal. There is a uniform, vertical gravitational field $\mathbf{g}$. (a) Find the Lagrangian $L(\phi, \dot{\phi})$. (b) Find the period T of small-amplitude oscillations about the stable equilibrium position.



Solution: