

Three massless rods are free to move on a common axis at the end of each rod. The other end of each rod is attached to a mass  $m$ . Rods 1 and 2, 2 and 3 and 3 and 1 are connected by torsional springs with torque  $\tau = -\kappa(\theta - \theta_0)$ , where  $\theta(t)$  is the instant angle, and  $\theta_0$  is the equilibrium angle for the rod, and  $\kappa$  is a constant. Write the Lagrangian for this system, find the equation of motion for each mass and determine the normal mode frequencies and eigenvectors. What motion does each eigenvector describe?

