

4 Problem 2.23

Consider two particles of masses m_1 and m_2 . Let m_1 be confined to move on a circle of radius a in the $z = 0$ plane, centered at $x = y = 0$. Let m_2 be confined to move on a circle of radius b in the $z = c$ plane centered at $x = y = 0$. A light (massless) spring of spring constant k is attached between the particles.

- (a) Find the Lagrangian of the system
- (b) Solve the problem using the Lagrange multipliers and give physical interpretation for each multiplier.

Note: Here you are supposed to use coordinates x_1, y_1 for the first particle and x_2, y_2 for the second one. These coordinates are not independent, thus Lagrange multipliers are necessary to write down the equations.