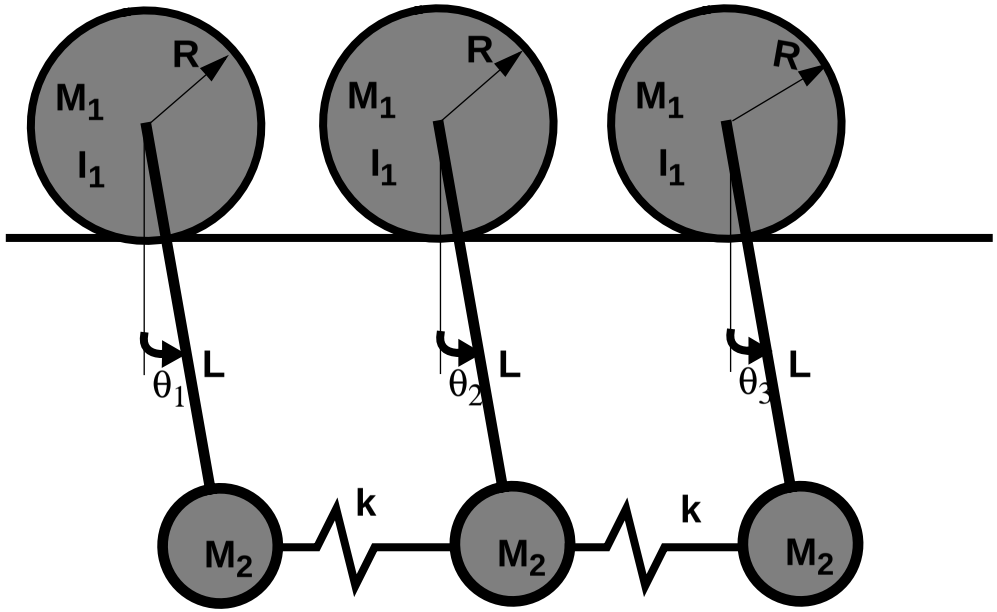
Problem 1
Part 1

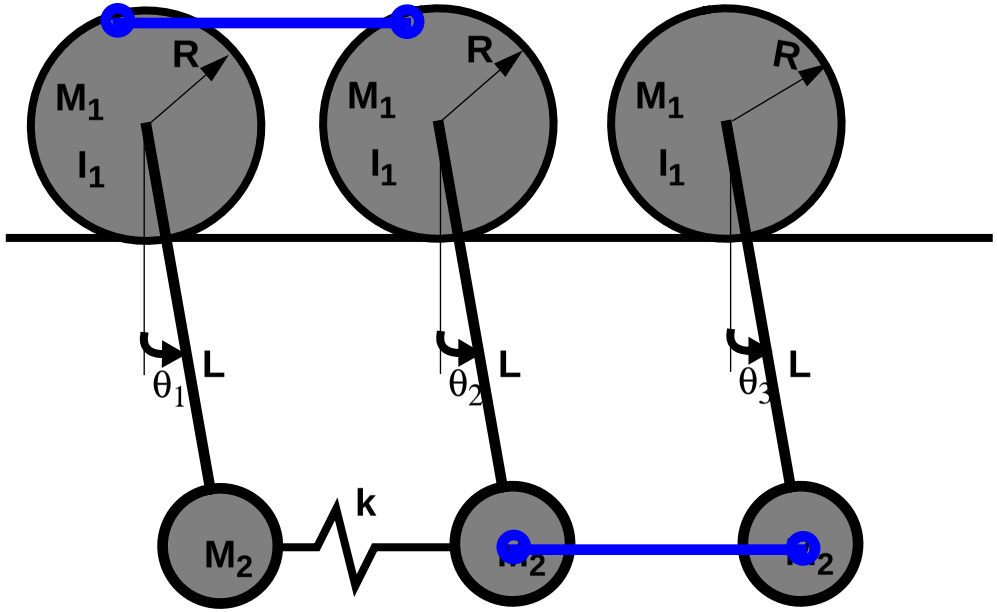
Part 1: For the system shown,

- **Derive the governing equations of the system**
- **Linearize those equations about the state of stable equilibrium**



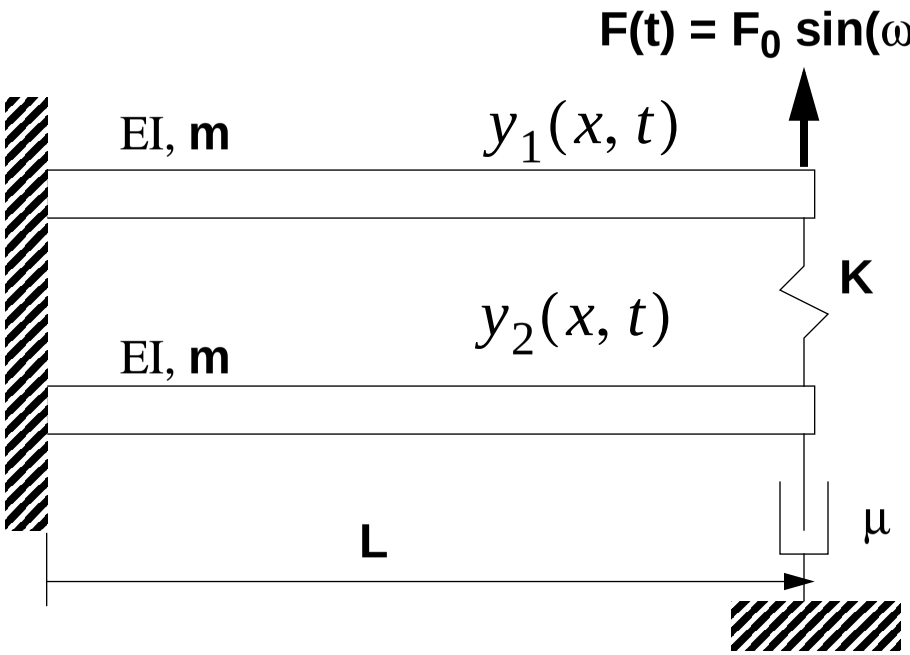
Problem 1
Part 2

Calculate the eigen modes and frequencies of the system, constrained by two links, as shown below



The top linkage is has a length equal to the distance between the centers of the disks.

Problem 2



Consider the configuration shown, assuming the beams deform as

$$y_1(x,t) = A(t)(x/L)^2$$

and

$$y_2(x,t) = B(t)(x/L)^2 .$$

In this figure, EI is the bending stiffness, m is mass per unit length, K is spring stiffness, and μ is the coefficient of the damper shown.

In steady state harmonic excitation, we expect that

$A(t) = Re\{A_0 e^{i\omega t}\}$ **and** $B(t) = Re\{B_0 e^{i\omega t}\}$.

Calculate A_0/F_0 **and** B_0/F_0