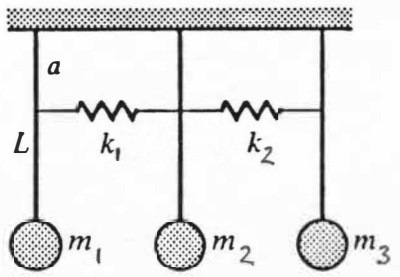
MECH 463 -- Tutorial 4

1. The vibrating system shown in the diagram consists of three pendulums of mass m_1, m_2, and m_3. They are supported on rigid massless rods of uniform length L. The pendulums are connected at distance a from their upper ends by springs of stiffness k_1 and k_2. Draw the free body diagrams of the system and formulate the equations of motion in matrix form for small amplitude vibrations. Do not proceed to solve the equations of motion or write the characteristic equation.



2. The diagram shows a double pendulum constructed of two rods of masses m_1 and m_2. Their moments of inertia about their centres of mass are J_1 and J_2. These centres of mass are at distances a_1 and a_2 from the upper ends of the rods. Draw the free body diagrams of the system and formulate the equations of motion in matrix form for small vibrations. Do not proceed to solve the equations of motion or write the characteristic equation.