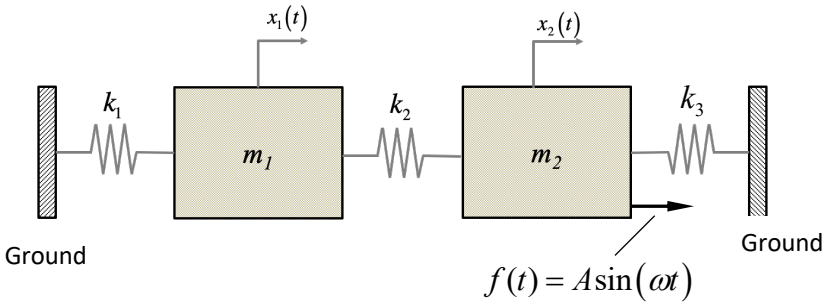
Vibrations - 2

For the system shown below:



1. (**15 points**) Derive the free body diagrams of the two masses.

2. (**20 points**) Derive the differential equations describing the motion of the two masses.

3. (**20 points**) Express the differential equations in matrix form.

4. (**25 points**) If $k_1 = 1\ N/m$, $k_2 = 1\ N/m$, $k_3 = 2\ N/m$, $m_1 = 1\ kg$, $m_2 = 2\ kg$, $A = 10\ N$ and $\omega = 2\ rad/\sec$ determine the steady-state response of the system.

5. (**20 points**) Describe <u>in words</u> the relative displacement motion of the two masses to each other at the above excitation frequency.