



Consider the two degree of freedom arrangement shown in the figure above. The motion is constrained to the  $x$  axis.

- (1) (10 pts) Draw the free body diagrams including the appropriate forces for the two masses.
  - (2) (15 pts) Determine the equation of motion for both masses.
  - (3) (15 pts) Derive the natural frequencies of the system.
  - (4) (10 pts) Plot the mode shapes of the system
- (50 pts total)