

24-352 DYNAMIC SYSTEMS & CONTROL

HOMEWORK ASSIGNMENT #14

DUE 5/2/01

This assignment counts $\frac{1}{2}$ of a normal assignment.

PROBLEM

Consider the mass/spring system shown in Figure 1 (it is the same as in last week's homework and you can use either your or my result from that assignment). Forces act on each of the masses as indicated. The initial conditions are

$$\bar{x}(0) = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \quad \text{and} \quad \dot{\bar{x}}(0) = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

Normalize your modes from last week so that their lengths are equal to 1. Suppose we express the solution to the vibration problem as

$$\bar{x}(t) = a_1(t)\bar{b}_1 + a_2(t)\bar{b}_2$$

where \bar{b}_1 is the normalized mode shape associated with the lower frequency mode. Determine $a_1(t)$.

