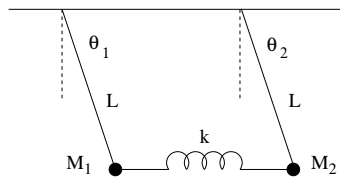


Mathematica Homework #3

*Email notebook to corbin@physics.ucla.edu
with a subject line: [Physics 105B]
Due on or about: Friday, 16 Nov*

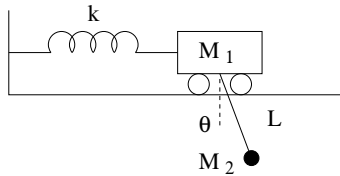
- In the first cell, enter all the usual stuff: your **name**, **student ID**, **email address** and the **assignment identifier** (eg. “HW 3”).

- 1)



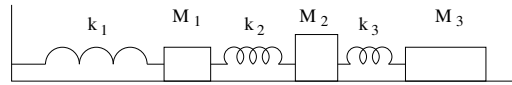
Consider the two plane pendulums (length L , masses M_1 and M_2 , respectively) that are joined by a massless spring of constant k , as shown. The natural length of the spring is equal to the distance between the two supports (so that the spring is unstretched when both pendulums are vertical). Find the (unnormalized) normal modes of oscillation for the system and animate them (you will have to choose reasonable values for the necessary physical parameters and assume that all the angles remain small).

- 2)



A simple pendulum is suspended from a cart that can oscillate on the end of a spring, as shown. Assuming that the angle remains small, find the (unnormalized) normal modes and animate the motion (after choosing reasonable values for the necessary physical parameters) for each.

• 3)



Find the normal modes for the system shown above and animate the motion for each.