Physics 820 homework due Mon Nov 11

Reading: Chapters 6, 7.1-6

Problems:


2. For the system in problem 6-12 in Goldstein, determine the particle positions as a function of time, if, at \( t = 0 \), (a) the displacements and the velocity of the second particle are zero while the first particle moves at a velocity \( v \), (b) the velocities and the displacement of the second particle are zero while the first particle is displaced by \( +d \). (c) Find the general solution of the equations of motion if the particles get subjected to friction forces proportional to velocities, with a proportionality coefficient \( \nu \).

3. A mass \( m \) is suspended from a support by a spring with spring constant \( m \omega_1^2 \). A second mass \( m \) is suspended from the first by a spring with spring constant \( m \omega_2^2 \). A vertical harmonic force \( F_0 \cos \omega t \) is applied to the upper mass. Find the steady-state motion for each mass. Examine what happens when \( \omega = \omega_2 \).

![Diagram of two masses connected by springs with forces applied.](image)


5. Goldstein, Problem 7-7.