

PHYSICS 1020

Homework #1

(Due Jan. 30, 2012)

1. (Giancoli 11-4) A fisherman's scale stretches 3.6 cm when a 2.7-kg fish hangs from it. (a) What is the spring stiffness constant and (b) what will be the amplitude and frequency of vibration if the fish is pulled down 2.5 cm more and released so that it vibrates up and down?
2. (Giancoli 11-5) An elastic cord vibrates with a frequency of 3.0 Hz when a mass of 0.60 kg is hung from it. What is its frequency if only 0.38 kg hangs from it?
3. (Giancoli 11-17) At what displacement from equilibrium is the energy of a SHO half KE and half PE?
4. (Giancoli 11-22) Figure 11-50 shows two examples of SHM, labeled A and B. For each, what is (a) the amplitude, (b) the frequency, and (c) the period? (d) Write the equations for both A and B in the form of a sine or cosine.
5. (Giancoli 11-29) How long must a simple pendulum be if it is to make exactly one swing per second? (That is, one complete oscillation takes exactly 2.0 s.)
6. (Giancoli 11-30) A pendulum has a period of 0.80 s on Earth. What is its period on Mars, where the acceleration of gravity is about 0.37 that on Earth?

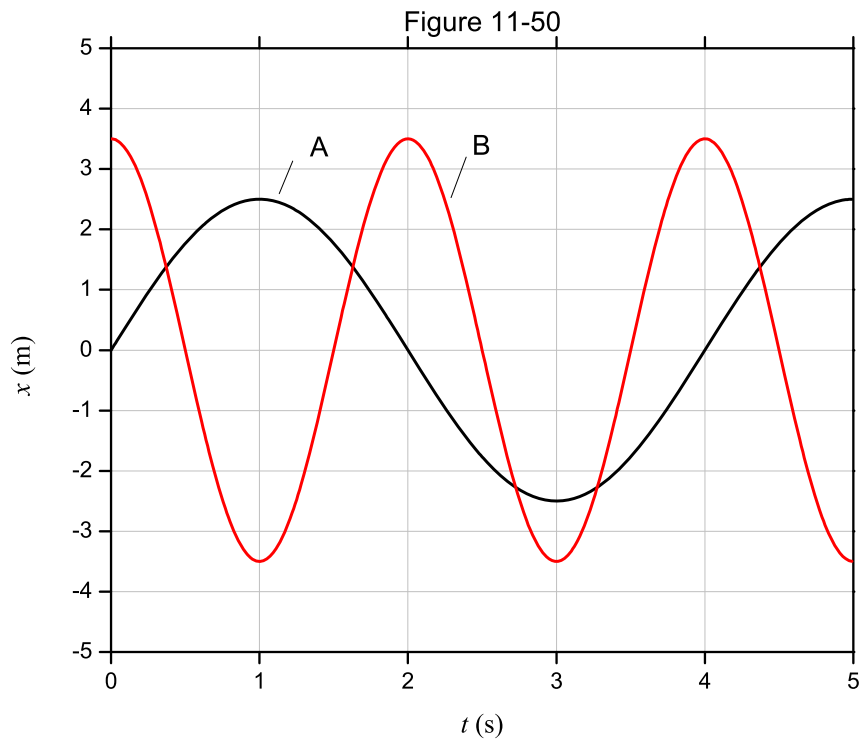


Figure 1: Fig. 11-50 for Problem 4.