

PHYSICS 1020

Homework #1

(Due Feb. 1, 2010)

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?

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?

11-17. At what displacement from equilibrium is the energy of a SHO half KE and half PE?

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.

11-29. How long must a simple pendulum be if it is to make exactly one swing per second? (That is, one complete vibration takes exactly 2.0 s.)

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?