

Waves/Periodic Motion

AP Physics – Mr. Hall

WORKSHEET # 3

Name: _____

1. A lass on a skate board throws a 5.6 kg medicine ball away from herself, giving it a speed of 15.0 m/s. The girl/skateboard's mass is 36 kg. What is the final velocity gained by the young woman?
2. A 1250 kg car has 3 passengers with a combined mass of 135 kg. The car has four identical springs that have a spring constant of 18 500 N/m. (a) Find the frequency of vibration for the car when it goes over the old speed bump. (b) How much time does it take for the car to go through 2 oscillations?
3. Sketch a series of standing waves on a string between two solid points. Show the first three harmonics.

4. A pipe is 155 cm long and open on one of its ends. (a) What are the frequencies of the first three harmonics that resonate in the pipe? (b) What is the wavelength of the first harmonic?

5. You spot a large pendulum that is swinging through a small arc. If the length of the pendulum is 5.5 m, what is the period of the thing?

6. You throw a 675 g ball straight up. If the ball takes 4.2 seconds to go up and down (where you like catch it at the same height) and if we ignore wind resistance, then find: (a) How high the ball goes, (b) the ball's initial velocity, (c) the ball's kinetic energy at the top of the flight, and (d) the kinetic energy just before you catch it.

7. A beam sticks out from a wall as shown. The mass of the uniform beam is 12.6 kg, the mass of the penguin is 1.25 kg. The angle of the cable is 65.0° . (a) Find the tension and (b) find the force exerted by the wall on the beam.

