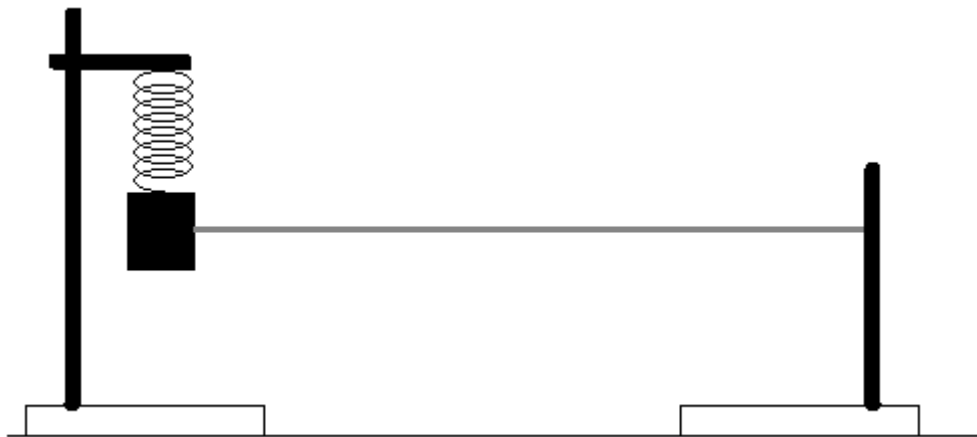**AP Physics 1 Unit #6 Pretest Problem**

Name _____

Period _____

A mass and spring system is attached to a string as shown above. The mass is 1.0 kg and the spring constant is 50.0 N/m. Ignore the effects of gravity on the energy of the mass and spring system for the following problems.

1. What is the period of the simple harmonic motion for the mass and spring?

2. If the mass is displaced 2.5 cm from its equilibrium position what is the energy stored in the spring? Use the equilibrium position as your reference for the elastic potential energy.

3. The mass and spring system is undergoing simple harmonic motion with an amplitude of 3.0 cm. What is the maximum speed of the mass during this motion?

4. The string attached to the mass is 2.0 m long and the wave speed in the string is 4.5 m/s. Treating the end attached to the mass as an antinode and the end attached to the ring stand as a node, what is the fundamental frequency of the string?

5. Is it possible to use the simple harmonic motion of the given mass and spring to set up a standing wave in the string? Give a detailed explanation of your reasoning.