NAME _____ DATE _____ CLASS _____

Chapter 12

HOLT PHYSICS

Mixed Review

Vibrations and Waves

1. A pendulum with a mass of 0.100 kg was released. The string made a 7.0° angle with the vertical. The bob of the pendulum returns to its lowest point every 0.10 s.

a. What is its period? What is its frequency?

_____

_____

b. The pendulum is replaced by one with a mass of 0.300 kg and set to swing with a 15° angle. Do the following quantities increase, decrease, or remain the same?

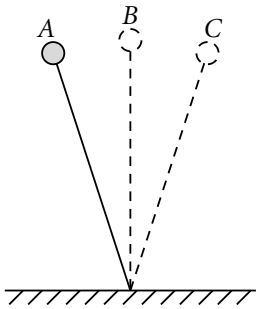
period _____

frequency _____

total energy _____

speed at the lowest point _____

2. A narrow, flat steel rod is anchored at its lower end, with a 0.500 kg ball welded to the top end. A force of 6.00 N is required to hold the ball 10.0 cm away from its central position.



If this arrangement is modeled as an oscillating horizontal mass-spring system, vibrating with a simple harmonic motion, find

a. the force constant, *k,* of the spring.

_____

b. the period and frequency of the oscillations.

_____

3. Find the acceleration due to gravity at a place where a simple pendulum 0.150 m long completes 1.00×10^2 oscillations in 3.00×10^2 seconds. Could this place be on Earth?

_____

_____

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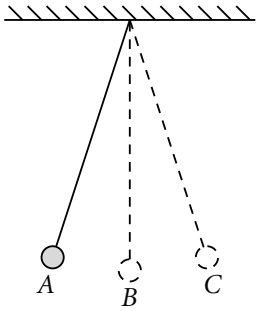
Chapter 12

HOLT PHYSICS

Mixed Review *continued*

4. Consider the first two cycles of a pendulum swinging from position *A* with a period of 2.00 s.



a. At which times is the bob found at positions *A*, *B*, and *C* during the first two cycles?

_____

_____

b. At which times and locations is gravitational potential energy at a maximum? At which times is kinetic energy at a maximum?

_____

_____

c. At which times and locations is the velocity at a maximum? the restoring force? the acceleration?

_____

_____

_____

5. The frequency of a pressure wave is 1.00×10^2 Hz. Its wavelength is 3.00 m. Find the speed of wave propagation.

_____

6. A pressure wave of 0.50 m wavelength propagates through a 3.00 m long coil spring at a speed of 2.00 m/s. How long does it take for the wave to travel from one end of the coil to the other? How many wavelengths fit in the coil?

_____

_____

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