Description

Due Friday Nov. 30, 2012

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1. Question Details SerCP9 13.P.018. [1588633]

An object-spring system oscillates with an amplitude of 4.0 cm. If the spring constant is 210 N/m and object has a mass of 0.50 kg, determine each of the following values.

(a) the mechanical energy of the system

[ ] J

(b) the maximum speed of the object

[ ] m/s

(c) the maximum acceleration of the object

[ ] m/s^2

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2. Question Details SerCP9 13.P.022. [1588611]

An object moves uniformly around a circular path of radius 21.5 cm, making one complete revolution every 2.10 s.

(a) What is the translational speed of the object?

[ ] m/s

(b) What is the frequency of motion in hertz?

[ ] Hz

(c) What is the angular speed of the object?

[ ] rad/s

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3. Question Details SerCP9 13.P.024. [1642382]

The period of motion of an object-spring system is T = 0.570 s when an object of mass m = 212 g is attached to the spring.

(a) Find the frequency of motion in hertz.

[ ] Hz

(b) Find the force constant of the spring.

[ ] N/m

(c) If the total energy of the oscillating motion is 0.241 J, find the amplitude of the oscillations.

[ ] m

4. Question Details SerCP9 13.P.034.WI. [1588829]

A man enters a tall tower, needing to know its height. He notes that a long pendulum extends from the ceiling almost to the floor and that its period is 20.5 s.

(a) How tall is the tower?

[ ] m

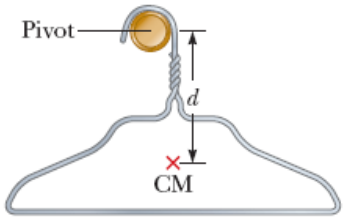
(b) If this pendulum is taken to the Moon, where the free-fall acceleration is 1.67 m/s^2, what is the period there?

[ ] s

5. Question Details SerCP9 13.P.038. [1642389]

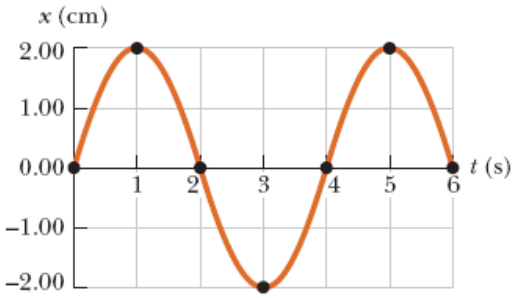
A coat hanger of mass m = 0.242 kg oscillates on a peg as a physical pendulum as shown in the figure below. The distance from the pivot to the center of mass of the coat hanger is d = 18.0 cm and the period of the motion is T = 1.13 s. Find the moment of inertia of the coat hanger about the pivot.

[ ] kg · m^2



6. Question Details SerCP9 13.P.042. [1594416]

An object attached to a spring vibrates with simple harmonic motion as described by the figure below.



(a) For this motion, find the amplitude.

[ ] cm

(b) For this motion, find the period.

[ ] s

(c) For this motion, find the angular frequency.

[ ] rad/s

(d) For this motion, find the maximum speed.

[ ] cm/s

(e) For this motion, find the maximum acceleration.

[ ] cm/s^2

(f) For this motion, find an equation for its position x in terms of a sine function. (Do this on paper. Your instructor may ask you to turn in this work.)

7. Question Details SerCP9 13.P.044. [1588594]

The distance between two successive minima of a transverse wave is 3.18 m. Five crests of the wave pass a given point along the direction of travel every 14.9 s.

(a) Find the frequency of the wave.

[ ] Hz

(b) Find the wave speed.

[ ] m/s

8. Question Details SerCP9 13.P.050. [1642377]

A circus performer stretches a tightrope between two towers. He strikes one end of the rope and sends a wave along it toward the other tower. He notes that it takes the wave 0.715 s to reach the opposite tower, 20.0 m away. If a 1.00-m length of the rope has a mass of 0.380 kg, find the tension in the tightrope.

[ ] N

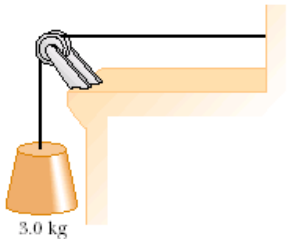
9. Question Details SerCP9 13.P.054.WI. [1588556]

An astronaut on a small planet wishes to measure the local value of g by timing pulses traveling down a wire which has a large object suspended from it. Assume a wire of mass 4.30 g is 1.60 m long and has a 3.00-kg object suspended from it. A pulse requires 63.9 ms to traverse the length of the wire. Calculate g_{planet} from these data. (You may neglect the mass of the wire when calculating the tension in it.)

g_{planet} = [ ] m/s^2

10. Question Details SerCP9 13.P.057. [1786196]

Tension is maintained in a string as in the figure below. The observed wave speed is 17 m/s when the suspended mass is 3.0 kg.



(a) What is the mass per unit length of the string?

[ ] kg/m

(b) What is the wave speed when the suspended mass is 1.6 kg?

[ ] m/s

Assignment Details

Name (AID): **Homework #10**
Submissions Allowed: **5**
Category: **Homework**
Code:
Locked: **No**
Author: **Segre, Phil** (psegre@physics.emory.edu)
Last Saved:
Permission: **Protected**
Randomization: **Person**
Which graded: **Last**

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