

Question

1 2 3 4 5 6 7 8

1. Question Details

SerCP9 5.P.020. [1588605]

When a 2.10-kg object is hung vertically on a certain light spring described by Hooke's law, the spring stretches 2.31 cm.

(a) What is the force constant of the spring?

 N/m

(b) If the 2.10-kg object is removed, how far will the spring stretch if a 1.05-kg block is hung on it?

 cm

(c) How much work must an external agent do to stretch the same spring 7.60 cm from its unstretched position?

 J

2. Question Details

SerCP9 5.P.058. [1588476]

A 680-kg elevator starts from rest and moves upward for 2.90 s with constant acceleration until it reaches its cruising speed, 1.63 m/s.

(a) What is the average power of the elevator motor during this period?

 W

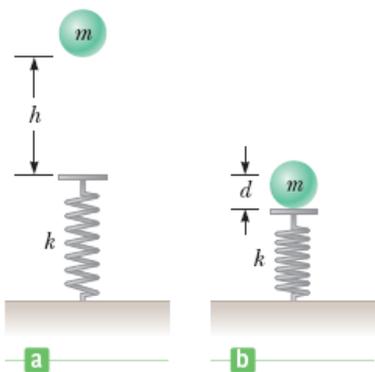
(b) How does this amount of power compare with its power during an upright trip with constant speed?

 W

3. Question Details

SerCP9 5.P.066. [1625453]

A ball of mass $m = 1.70$ kg is released from rest at a height $h = 74.0$ cm above a light vertical spring of force constant k as in Figure [a] shown below. The ball strikes the top of the spring and compresses it a distance $d = 8.60$ cm as in Figure [b] shown below. Neglecting any energy losses during the collision, find the following.



(a) Find the speed of the ball just as it touches the spring.

 m/s

(b) Find the force constant of the spring.

 N/m

4. Question Details

SerCP9 6.P.012. [1588656]

A tennis player receives a shot with the ball (0.0600 kg) traveling horizontally at 56.0 m/s and returns the shot with the ball traveling horizontally at 30.0 m/s in the opposite direction.

(a) What is the impulse delivered to the ball by the racket?

N · s

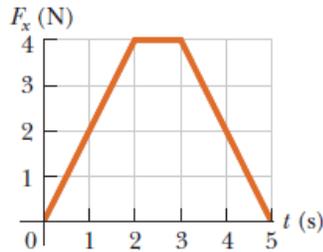
(b) What work does the racket do on the ball?

J

5. Question Details

SerCP9 6.P.016. [1594412]

A force of magnitude F_x acting in the x -direction on a 2.80-kg particle varies in time as shown in the figure below.



(a) Find the impulse of the force.

kg · m/s

(b) Find the final velocity of the particle if it is initially at rest.

m/s

(c) Find the final velocity of the particle if it is initially moving along the x -axis with a velocity of -2.10 m/s.

m/s

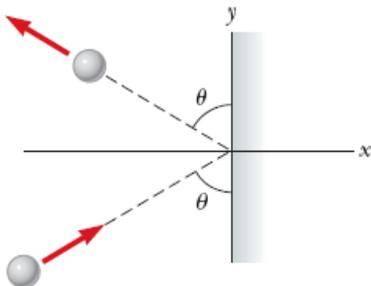
6. Question Details

SerCP9 6.P.018.WI. [1635702]

A 2.76-kg steel ball strikes a massive wall at 10.0 m/s at an angle of $\theta = 60.0^\circ$ with the plane of the wall. It bounces off the wall with the same speed and angle (see the figure below). If the ball is in contact with the wall for 0.174 s, what is the average force exerted by the wall on the ball? (Take to the right as the $+x$ -direction and up as the $+y$ -direction.)

magnitude N

direction ° counterclockwise from the $+x$ -axis



7. Question Details

SerCP9 6.P.022. [1588552]

A rifle with a weight of 40 N fires a 5.5-g bullet with a speed of 220 m/s.

(a) Find the recoil speed of the rifle.

m/s

(b) If a 650-N man holds the rifle firmly against his shoulder, find the recoil speed of the man and rifle.

m/s

8. Question Details

SerCP9 6.P.030. [1589072]

An archer shoots an arrow toward a 300-g target that is sliding in her direction at a speed of 2.40 m/s on a smooth, slippery surface. The 22.5-g arrow is shot with a speed of 36.0 m/s and passes through the target, which is stopped by the impact. What is the speed of the arrow after passing through the target?

m/s

Assignment Details

Name (AID): Homework #6 - Due Wed. Oct. 16, 2013

Submissions Allowed: 5

Category: Homework

Code:

Locked: No

Author: Segre, Phil (psegre@physics.emory.edu)

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