Description

Chapter 5, Problems 6, 12, 16, 20, 23, 30, 36, 38. Due Friday October 5, 2012.

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1. Question Details SerCP9 5.P.006. [1588643]

A horizontal force of 150 N is used to push a 45.5-kg packing crate a distance of 7.20 m on a rough horizontal surface. If the crate moves at constant speed, find each of the following.

(a) the work done by the 150-N force

[ ] J

(b) the coefficient of kinetic friction between the crate and the surface

[ ]

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2. Question Details SerCP9 5.P.012. [1588504]

A worker pushing a 35.0-kg wooden crate at a constant speed for 9.8 m along a wood floor does 390 J of work applying a constant horizontal force of magnitude F_0 on the crate.

(a) Determine the value of F_0.

[ ] N

(b) If the worker now applies a force greater than F_0, describe the subsequent motion of the crate.

(c) Describe what would happen to the crate if the applied force is less than F_0.

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3. Question Details SerCP9 5.P.016. [1588803]

A 0.34-kg particle has a speed of 8.0 m/s at point *A* and kinetic energy of 7.5 J at point *B*.

(a) What is its kinetic energy at *A*?

[ ] J

(b) What is its speed at point *B*?

[ ] m/s

(c) What is the total work done on the particle as it moves from *A* to *B*?

[ ] J

4. Question Details SerCP9 5.P.020. [1588605]

When a 2.80-kg object is hung vertically on a certain light spring described by Hooke's law, the spring stretches 2.44 cm.

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

[ ] N/m

(b) If the 2.80-kg object is removed, how far will the spring stretch if a 1.40-kg block is hung on it?

[ ] cm

(c) How much work must an external agent do to stretch the same spring 8.30 cm from its unstretched position?

[ ] J

5. Question Details SerCP9 5.P.023.MI.FB. [1623920]

A 1,800-kg pile driver is used to drive a steel I-beam into the ground. The pile driver falls 6.40 m before coming into contact with the top of the beam, and it drives the beam 14.4 cm farther into the ground as it comes to rest. Using energy considerations, calculate the average force the beam exerts on the pile driver while the pile driver is brought to rest.

magnitude [ ] N

direction ---Select---

6. Question Details SerCP9 5.P.030. [1588710]

A projectile of mass m is fired horizontally with an initial speed of v_0 from a height of h above a flat, desert surface. Neglecting air friction, at the instant before the projectile hits the ground, find the following in terms of m, v_0, h, and g.

(a) the work W done by the force of gravity on the projectile

$W =$

(b) the change in kinetic energy ΔKE of the projectile since it was fired

$\Delta KE =$

(c) the final kinetic energy KE_f of the projectile

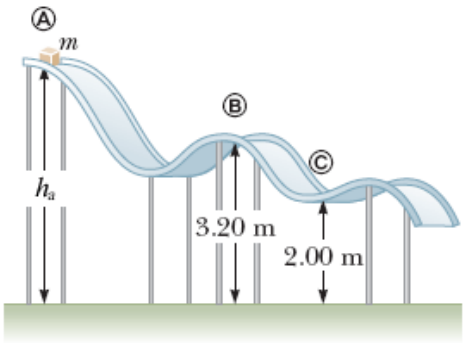
$KE_f =$

(d) Are any of the answers changed if the initial angle is changed?

- Yes
- No

7. Question Details SerCP9 5.P.036. [2188045]

A block of mass m = 5.40 kg is released from rest from point Ⓐ and slides on the frictionless track shown in the figure below. (Assume h_a = 7.80 m.)



(a) Determine the block's speed at points Ⓑ and Ⓒ.

point Ⓑ ☐ m/s

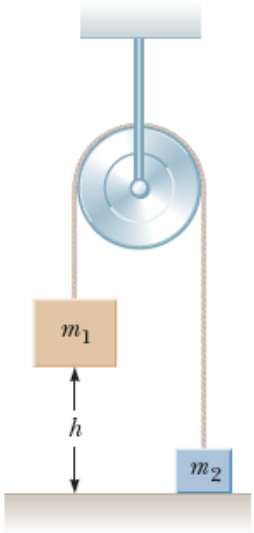
point Ⓒ ☐ m/s

(b) Determine the net work done by the gravitational force on the block as it moves from point Ⓐ to point Ⓒ.

☐ J

8. Question Details SerCP9 5.P.038. [1625459]

Two blocks are connected by a light string that passes over a frictionless pulley as in the figure below. The system is released from rest while m_2 is on the floor and m_1 is a distance h above the floor.



(a) Assuming $m_1 > m_2$, find an expression for the speed of m_1 just as it reaches the floor. (Use any variable or symbol stated above along with the following as necessary: g.)

v_f =

(b) Taking m_1 = 6.3 kg, m_2 = 3.7 kg, and h = 3.1 m, evaluate your answer to part (a).

☐ m/s

(c) Find the speed of each block when m_1 has fallen a distance of 1.7 m.

☐ m/s

9. Question Details SerCP9 5.P.044. [1589204]

A 21.0-kg child on a 1.00-m-long swing is released from rest when the ropes of the swing make an angle of 35.0° with the vertical.

(a) Neglecting friction, find the child's speed at the lowest position.

[ ] m/s

(b) If the actual speed of the child at the lowest position is 1.60 m/s, what is the mechanical energy lost due to friction?

[ ] J

10. Question Details SerCP9 5.P.058. [1588476]

A 641-kg elevator starts from rest and moves upward for 3.10 s with constant acceleration until it reaches its cruising speed, 1.68 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

Assignment Details

Name (AID): **Homework #5 (2854041)**
Submissions Allowed: **5**
Category: **Homework**
Code:
Locked: **No**
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Last Saved: **Sep 27, 2012 04:02 PM EDT**
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