AP Physics - Work Energy Chapter 7

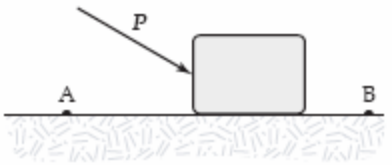
Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. A constant force of 12 N in the positive *x* direction acts on a 4.0-kg object as it moves from the origin to the point $\left(6\hat{\mathbf{i}} - 8\hat{\mathbf{j}}\right)$ m. How much work is done by the given force during this displacement?
a. +60 J
b. +84 J
c. +72 J
d. +48 J
e. +57 J

____ 2. A 2.0-kg particle has an initial velocity of $\left(5\hat{\mathbf{i}} - 4\hat{\mathbf{j}}\right)$ m/s. Some time later, its velocity is $7\hat{\mathbf{i}} + 3\hat{\mathbf{j}}$ m/s. How much work was done by the resultant force during this time interval, assuming no energy is lost in the process?
a. 17 J
b. 49 J
c. 19 J
d. 53 J
e. 27 J

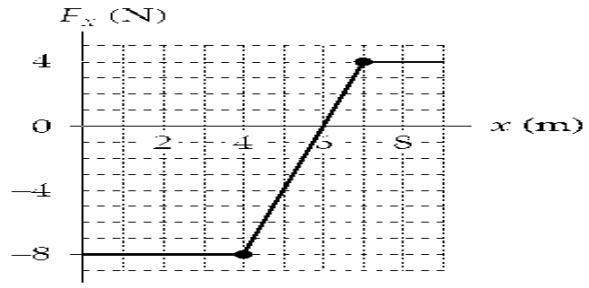
____ 3. A block is pushed across a rough horizontal surface from point A to point B by a force (magnitude P = 5.4 N) as shown in the figure. The magnitude of the force of friction acting on the block between A and B is 1.2 N and points A and B are 0.5 m apart. If the kinetic energies of the block at A and B are 4.0 J and 5.6 J, respectively, how much work is done on the block by the force P between A and B?

a. 2.7 J
b. 1.0 J
c. 2.2 J
d. 1.6 J
e. 3.2 J



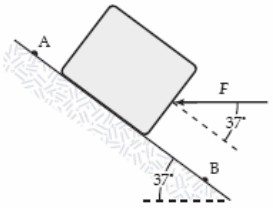
____ 4. A body moving along the *x* axis is acted upon by a force F_x that varies with *x* as shown. How much work is done by this force as the object moves from x = 1 m to x = 8 m?

a. –2 J
b. –18 J
c. –10 J
d. –26 J
e. +18 J



____ 5. A 4.0-kg block is lowered down a 37° incline a distance of 5.0 m from point A to point B. A horizontal force (F = 10 N) is applied to the block between A and B as shown in the figure. The kinetic energy of the block at A is 10 J and at B it is 20 J. How much work is done on the block by the force of friction between A and B?

a. –58 J
b. –53 J
c. –68 J
d. –63 J
e. –47 J

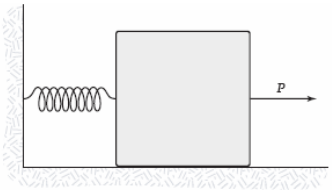


____ 6. At what rate is the gravitational force on a 2.0-kg projectile doing work at an instant when the velocity of the projectile is 4.0 m/s directed 30° above the horizontal?

a. +39 W
b. –78 W
c. –39 W
d. +78 W
e. +25 W

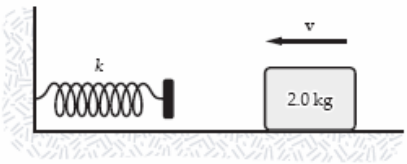
____ 7. A 10-kg block on a horizontal frictionless surface is attached to a light spring (force constant = 0.80 kN/m). The block is initially at rest at its equilibrium position when a force (magnitude P = 80 N) acting parallel to the surface is applied to the block, as shown. What is the speed of the block when it is 13 cm from its equilibrium position?

a. 0.85 m/s
b. 0.89 m/s
c. 0.77 m/s
d. 0.64 m/s
e. 0.52 m/s



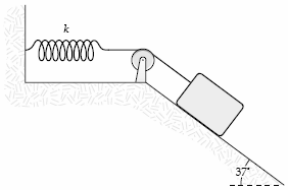
____ 8. The horizontal surface on which the block slides is frictionless. The speed of the block before it touches the spring is 6.0 m/s. How fast is the block moving at the instant the spring has been compressed 15 cm? k = 2.0 kN/m

a. 3.7 m/s
b. 4.4 m/s
c. 4.9 m/s
d. 5.4 m/s
e. 14 m/s



____ 9. A 2.0-kg block situated on a frictionless incline is connected to a light spring (k = 100 N/m), as shown. The block is released from rest when the spring is unstretched. The pulley is frictionless and has negligible mass. What is the speed of the block when it has moved 0.20 m down the plane?

a. 76 cm/s
b. 68 cm/s
c. 60 cm/s
d. 82 cm/s
e. 57 cm/s



____ 10. Two vectors $\vec{\mathbf{A}}$ and $\vec{\mathbf{B}}$ are given by $\vec{\mathbf{A}} = 5\hat{\mathbf{i}} + 6\hat{\mathbf{j}} + 7\hat{\mathbf{k}}$ and $\vec{\mathbf{B}} = 3\hat{\mathbf{i}} - 8\hat{\mathbf{j}} + 2\hat{\mathbf{k}}$. If these two vectors are drawn starting at the same point, what is the angle between them?

a. 106°
b. 102°
c. 110°
d. 113°
e. 97°

AP Physics - Work Energy Chapter 7
Answer Section

MULTIPLE CHOICE

1. ANS: C PTS: 1
2. ANS: A PTS: 1
3. ANS: C PTS: 1
4. ANS: D PTS: 1
5. ANS: C PTS: 1
6. ANS: C PTS: 1
7. ANS: A PTS: 1
8. ANS: A PTS: 1
9. ANS: C PTS: 1
10. ANS: B PTS: 1