Chapter 7

Energy

How much work is done on a 200-kg crate that is hoisted 2 m in a time of 4 s?

a. 400 J
b. 1000 J
c. 1600 J
d. 4000 J

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a. 400 J
b. 1000 J
c. 1600 J
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How much power is required to raise a 200-kg crate a vertical distance of 2 m in a time of 4 s?

a. 400 W
b. 1000 W
c. 1600 W
d. 4000 W

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When work is done twice as quickly, then the power expended is

a. half.

b. the same.

c. twice.

d. 4 times as much.

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If a charging elephant has kinetic energy, it must also have

a. potential energy.
b. momentum.
c. work.
d. All of these.

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a. potential energy.
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A model airplane moves twice as fast as another identical model airplane. Compared with the kinetic energy of the slower airplane, the kinetic energy of the faster airplane is

a. the same for level flight.
b. twice as much.
c. 4 times as much.
d. more than 4 times as much.

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An empty truck traveling at 10 km/h has kinetic energy. How much kinetic energy does it have when its speed is doubled?

a. The same KE

b. Twice the KE

c. 4 times the KE

d. More than 4 times the KE

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When an increase in speed doubles the momentum of a moving body, its kinetic energy

a. increases, but less than doubles.
b. doubles.
c. more than doubles.
d. depends on factors not stated.

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A model airplane moves 3 times as fast as another identical model airplane. Compared with the kinetic energy of the slower airplane, the kinetic energy of the faster airplane is

a. the same for level flight.
b. twice as much.
c. 4 times as much.
d. more than 4 times as much.

A model airplane moves 3 times as fast as another identical model airplane. Compared with the kinetic energy of the slower airplane, the kinetic energy of the faster airplane is

a. the same for level flight.
b. twice as much.
c. 4 times as much.
d. more than 4 times as much.

A dog and a mouse run down the road with the same KE. The faster moving one is the

a. dog.

b. mouse.

c. Both run at the same speed.

d. Can’t say.

A dog and a mouse run down the road with the same KE. The faster moving one is the

a. dog.

b. mouse.

c. Both run at the same speed.

d. Can't say.

Explanation: Let the equation, KE = 1/2 mv^2 guide your thinking. A small mass having the same KE must have the greater speed.

A 1-kg ball has twice the speed as a 2-kg ball. Compared with the 1-kg ball, the 2-kg ball has

a. the same kinetic energy.
b. twice the kinetic energy.
c. 4 times the kinetic energy.
d. more than 4 times the kinetic energy.

A 1-kg ball has twice the speed as a 2-kg ball. Compared with the 1-kg ball, the 2-kg ball has

a. the same kinetic energy.
b. twice the kinetic energy.
c. 4 times the kinetic energy.
d. more than 4 times the kinetic energy.

Explanation: Let the equation, KE = 1/2 mv^2 guide your thinking.

When a car is braked to a stop, unless it is a hybrid, its kinetic energy is transformed to

a. stopping energy.

b. potential energy.

c. energy of motion.

d. heat.

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When two identical cars, one traveling twice as fast as the other, brake to a stop using old-fashioned brakes, the faster car will skid

a. the same distance.

b. twice as far.

c. 4 times as far.

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Explanation: Let the equation, KE = 1/2 mv^2 guide your thinking.

Which of the following equations is most directly useful for solving a problem that asks for the distance a speeding vehicle skids in coming to a stop?

a. $F = ma$

b. $Ft = \Delta(mv)$

c. KE = $1/2\ mv^2$

d. $Fd = \Delta(1/2\ mv^2)$

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c. KE = $1/2\ mv^2$

d. $Fd = \Delta(1/2\ mv^2)$

Explanation: That's right—the work-energy theorem.

A shiny sports car at the top of a vertical cliff has a potential energy of 100 MJ relative to the ground below. Unfortunately, a mishap occurs and it falls over the edge. When it is halfway to the ground, its kinetic energy is

a. 25 MJ.

b. 50 MJ.

c. about 100 MJ.

d. more than 100 MJ.

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A pendulum bob swings to and fro. Its kinetic energy and its potential energy relative to the bottom of its swing are the same at

a. the bottom.

b. one-quarter the vertical distance between the bottom and top of the swing.

c. one-half the vertical distance between the bottom and the top of the swing.

d. the top of the swing.

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In an ideal pulley system, a woman lifts an 80-N crate by pulling a rope downward with a force of 20 N. For every 1-meter length of rope she pulls downward, the crate rises

a. 50 cm.

b. 45 cm.

c. 25 cm.

d. less than 25 cm.

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When you do 1000 J of work on a car jack and the gravitational potential energy of the car is increased by 300 J, the efficiency of the jack is

a. 30%.

b. 50%.

c. 70%.

d. 130%.

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c. 70%.
d. 130%.

A simple machine CANNOT multiply

a. force.
b. distance.
c. energy.
d. None of these.

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Which of these forms of energy is NOT renewable?

a. wind power

b. solar power

c. fossil-fuel power

d. photovoltaic power

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a. wind power

b. solar power

c. fossil-fuel power

d. photovoltaic power

The most energy per unit mass can be extracted from

a. coal.
b. petroleum.
c. natural gas.
d. uranium.

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