1) If the kinetic energy of a given mass is to be doubled, its speed must be multiplied by

A) 8 B) $\sqrt{2}$ C) 2 D) 4

2) When the speed of an object is halved, its kinetic energy is

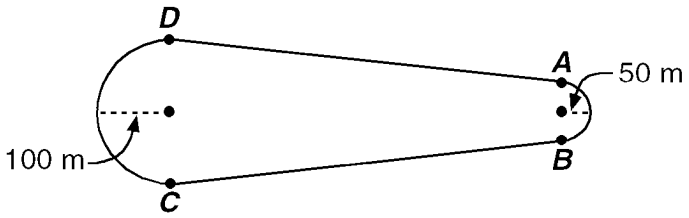
A) quartered B) doubled C) halved D) the same

3) A cart of mass *m* traveling at speed *v* has kinetic energy *KE*. If the mass of the cart is doubled and its speed is halved, the kinetic energy of the cart will be

A) twice as great B) four times as great C) one-fourth as great D) half as great

Question 4 refers to the following:

The diagram below represents a flat racetrack as viewed from above, with the radii of its two curves indicated. A car with a mass of 1,000 kilograms moves counterclockwise around the track at a constant speed of 20 meters per second.



4) Compared to the kinetic energy of the car while moving from *A* to *D*, the kinetic energy of the car while moving from *D* to *C* is

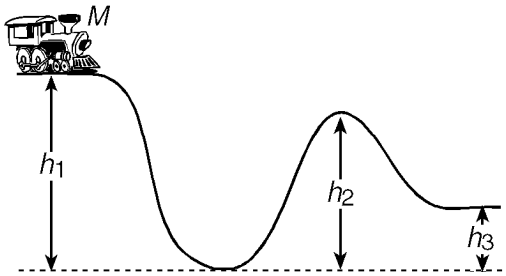
A) the same C) less

B) greater

5) A 1.0-kilogram mass gains kinetic energy as it falls freely from rest a vertical distance, *d*. How far would a 2.0-kilogram mass have to fall freely from rest to gain the same amount of kinetic energy?

A) *d* B) $\frac{d}{4}$ C) $\frac{2}{d}$ D) $\frac{d}{2}$

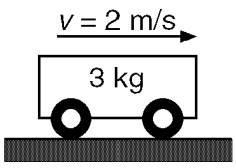
6) A train of mass *M* on a frictionless track starts from rest at the top of a hill having height h_1, as shown in the diagram below.

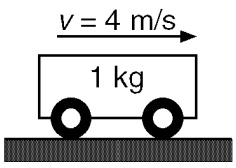


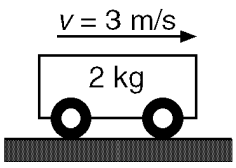
What is the kinetic energy of the train when it reaches the top of the next hill, having height h_2?

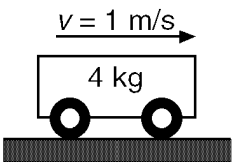
A) $Mg(h_2 - h_3)$ B) $Mg(h_2 - h_2)$ C) $Mg \bullet h_1$ D) 0

7) Which cart shown below has the *greatest* kinetic energy?

A) 

B) 

C) 

D) 

8) The kinetic energy of a 10.0-kilometer mass moving at a speed of 5.00 meters per second is

A) 2.00 J B) 250. J C) 125 J D) 50.0 J

9) A baseball bat strikes a ball with an average force of 2.0×10^4 newtons. If the bat stays in contact with the ball for a distance of 5.0×10^{-3} meter, what kinetic energy will the ball acquire from the bat?

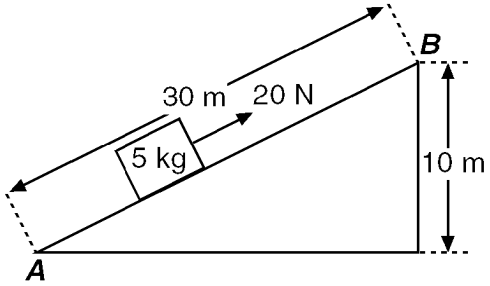
A) 2.5×10^1 joules B) 1.0×10^2 joules C) 2.0×10^2 joules D) 4.0×10^2 joules

10) A 1.0×10^3-kilogram car is moving at a constant speed of 4.0 meters per second. What is the kinetic energy of the car?

A) 4.0×10^3 J B) 1.6×10^3 J C) 8.0×10^3 J D) 2.0×10^4 J

Question 11 refers to the following:

The diagram below represents a 20-newton force pulling an object up a hill at a constant rate of 2 meters per second.



11) The kinetic energy of the moving object is

A) 5 J B) 10 J C) 15 J D) 50 J

12) A student rides a bicycle up a 30.° hill at a constant speed of 6.00 meters per second. The combined mass of the student and bicycle is 70.0 kilograms. What is the kinetic energy of the student-bicycle system during this ride?

A) 2,520 J B) 420. J C) 1,260 J D) 210. J