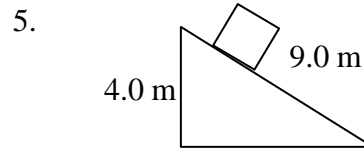


## Law of Conservation of Energy Worksheet

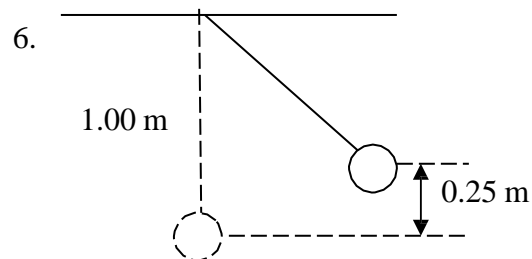
Use the Law of Conservation of Energy to solve the following problems.

1. 50 kg physics student is dropped.  
If they reach the floor at a speed of 3.2 m/s, from what height did they fall?



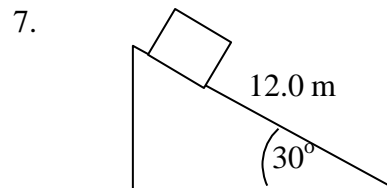
A 5.0 kg box slides down a frictionless ramp. If it starts at rest, what is its speed at the bottom?

2. A 100 kg object is dropped from a vertical height of 8.0 m. What is its speed when it hits the ground?



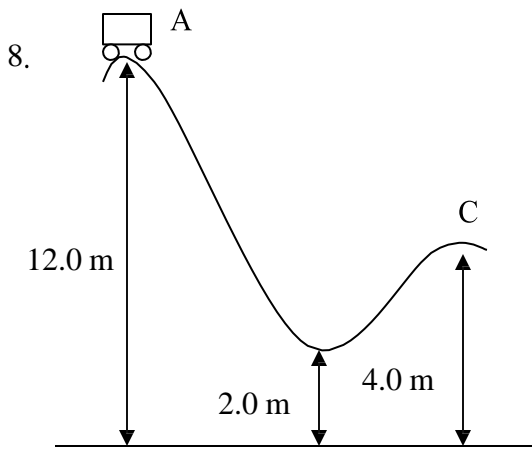
A 400 g pendulum is dropped from the position shown, 0.25m above its equilibrium position. What is the speed of the pendulum bob as it passes through its equilibrium position?

3. A 2.5 kg bowling ball is dropped from the top of a building. If it hits the ground with a speed of 37.0 m/s, how tall was the building?

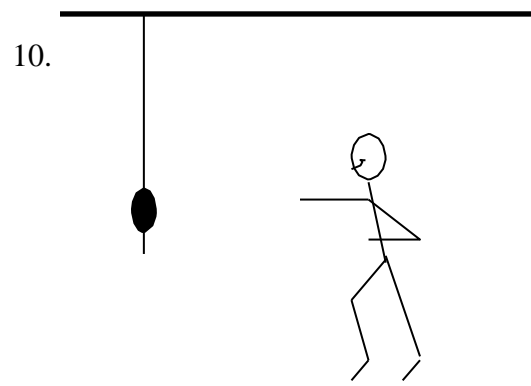


4. A 10.0 kg box is hurled down from the top of a  $1.3 \times 10^2$  m building at a speed of 11.0 m/s. What is its velocity as it hits the ground, if 500 J of heat energy is created due to air resistance?

A 6.0 kg box slides down an incline as shown. If the box starts at 5 m/s, and has a speed of 3.0 m/s at the bottom, how much heat energy was created?

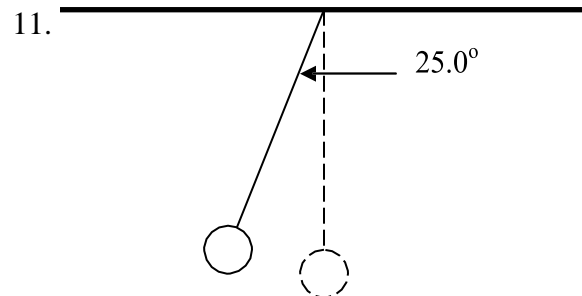


A 150 kg roller coaster car starts from 10 m/s at point A. What is its speed at point C if the track is frictionless?



An 80.0 kg student running at 3.5 m/s grabs a rope that is hanging vertically. How high will the student swing, if 50 J of heat energy is produced due to friction?

9. A 2.5 kg object is dropped from a height of 10.0 m above the ground. Calculate the speed of the object as it hits the ground.



A pendulum is 1.20 m long. If the pendulum is pulled until it makes a  $25.0^\circ$  angle to the vertical, what is the speed of the pendulum bob when it passes through its equilibrium position? HINT: Determine the vertical drop of the pendulum bob first.