This print-out should have 14 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Sliding a Box
001 (part 1 of 4) 10.0 points

A 57.9 kg box initially at rest is pushed 7.14 m along a rough, horizontal floor with a constant applied horizontal force of 131.382 N.

If the coefficient of friction between box and floor is 0.197, find the work done by the applied force. The acceleration of gravity is $9.8\ \mathrm{m/s^2}$.

---

002 (part 2 of 4) 10.0 points

Find the work done by the friction.

Submit answer as negative.

---

003 (part 3 of 4) 10.0 points

Find the change in kinetic energy of the box.

Submit answer as positive.

---

004 (part 4 of 4) 10.0 points

Find the the final speed of the box.

Slamming on the Brakes
005 10.0 points

A car and driver weighing 8170 N passes a sign stating "Bridge Out 22.4 m Ahead." She slams on the brakes, and the car decelerates at a constant rate of $9.76\ \mathrm{m/s^2}$.

The acceleration of gravity is $9.8\ \mathrm{m/s^2}$.

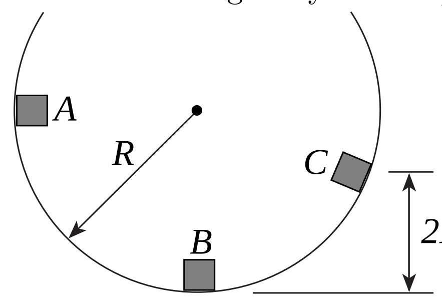
What is the magnitude of the work done stopping the car if the car just stops in time to avoid diving into the water?

Correct answer: 1.82261×10^5 J.

Hemispherical Bowl
006 (part 1 of 4) 10.0 points

A 240 g particle is released from rest at point A along the diameter on the inside of a frictionless, hemispherical bowl of radius 25.9 cm.

The acceleration of gravity is $9.8\ \mathrm{m/s^2}$.



Calculate its gravitational potential energy at point A relative to point B.

Correct answer: 0.609168 J.

---

007 (part 2 of 4) 10.0 points

Calculate its kinetic energy at point B.

Correct answer: 0.609168 J.

---

008 (part 3 of 4) 10.0 points

Calculate its kinetic energy at point C at height $\frac{2R}{3}$.

Correct answer: 0.203056 J.

---

009 (part 4 of 4) 10.0 points

Calculate its potential energy at point C.

Correct answer: 0.406112 J.

Serway CP 05 35
010 10.0 points

A block of mass 0.26 kg is placed on a vertical spring of constant 6429 N/m and pushed downward, compressing the spring 0.16 m. After the block is released it leaves the spring and continues to travel upward.

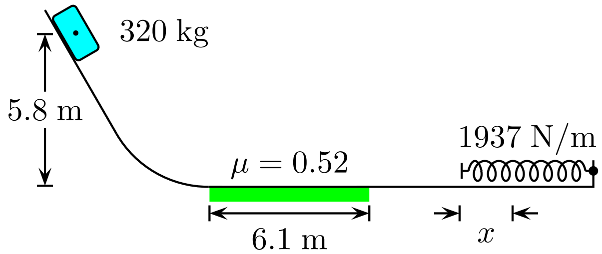
The acceleration of gravity is $9.8\ \mathrm{m/s^2}$.

What height above the point of release will the block reach if air resistance is negligible?

Correct answer: 32.2964 m.

Stopped By a Spring 01
011 10.0 points

A 320 kg block is released at a 5.8 m height as shown. The track is frictionless except for a portion of length 6.1 m. The block travels down the track, hits a spring of force constant 1937 N/m. The coefficient of kinetic friction between surface and block over the 6.1 m track length is 0.52.



Determine the compression of the spring x from its equilibrium position before coming to rest momentarily. The acceleration of gravity is 9.8 m/s^2.

Correct answer: 2.9171 m.

Climbing a Rope 02
012 10.0 points

A student weighing 595 N climbs at constant speed to the top of an 9 m vertical rope in 11 s.

What is the average power expended by the student to overcome gravity?

Correct answer: 486.818 W.

Holt SF 05Rev 35
013 10.0 points

An automobile engine delivers 56.6 hp.

How much time will it take for the engine to do 6.10×10^5 J of work? One horsepower is equal to 746 watts.

Correct answer: 14.4469 s.

Frictional Force on a Car
014 10.0 points

When an automobile moves with constant velocity, the power developed is used to overcome the frictional forces exerted by the air and the road.

If the engine develops 40 hp, what total frictional force acts on the car at 95 mph? One horsepower equals 746 W, and one mile is 1609 m.

Correct answer: 702.784 N.