Name_____

AP Physics 1 Review Questions

Integrating Content, Inquiry, and Reasoning

1. A 1.15-kg block is released from rest on a frictionless inclined plane. The inclined plane forms an angle of 35° with the ground. The block slides down the inclined plane and compresses a spring at the bottom by 3.5 cm and stops momentarily. If 334 N are required to compress the spring by 2.4 cm, what distance has the block travelled?

2. A student attempts to fire a small steel sphere (mass = 250 g) into a cup from a spring-loaded cannon affixed to a table. The cup is located 74.7 cm from the table's edge. The height of the table is 85 cm. If compressing the spring by 2.2 cm results in the sphere travelling 82.2 cm, by what distance should the spring be compressed to project the sphere into the cup?

3. Consider the box and sphere on the ramps below. The box and sphere have the same mass. When released, the box slides down the frictionless ramp and off the table. The sphere rolls down the ramp without slipping and off the table. The table is 1.00-m tall. Which goes farther: the box or the sphere? Explain.
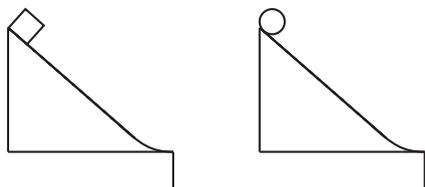
4. How long must a 25° ramp be to slow to a momentary stop a runaway truck moving along a truly horizontal highway at
140 kilometers per hour?

5. Why must all of the experimental horizontal travel distances of the steel spheres necessarily be less than the potential, theoretical travel distance?