

1. A 1 kg mass is compressed into a spring at the bottom of a hill. Assume there is friction. The top of the hill is 4 meters higher than the bottom. The spring is released and the mass is sent up the hill. At the level surface at the top of the hill the mass has velocity 9 m/s. If 3 Joules of heat are generated as the object slides up the hill, what is the initial elastic energy in Joules stored in the spring?
2. A 4 kg mass has an initial velocity of 17 m/s at the bottom of a hill. Assume there is friction. The object slides to a point where the vertical height is 3 meters before it comes to a stop. How much friction heat is generated in Joules as the object slides up the hill?
3. A car with mass 1.4 kg is at the top of a hill of height 8.7 meters and has initial velocity of 1.8 m/s. If there is no friction, what is the velocity of the car at the bottom of the hill?

