Energy Homework Problems 11-15

11.) A projectile is fired at an upward angle of 45.0º from the top of a 265 m cliff with a speed of 185 m/s. What will be its speed when it strikes the ground below? (Use conservation of energy.)

12.) A sled is initially given a shove up a frictionless 28.0º incline. It reaches a maximum vertical height 1.35 m higher than where it started. What was its initial speed?
13.) The roller-coaster car shown in the figure below is dragged up to point 1 where it is released from rest. Assuming no friction, calculate the speed at points 2, 3, and 4.

14.) A 145 g baseball is dropped from a tree 13.0 m above the ground. (a) With what speed would it hit the ground if air resistance could be ignored? (b) If it actually hits the ground with a speed of 8.00 m/s what is the average force of air resistance exerted on it?

15.) You drop a ball from a height of 2.0 m, and it bounces back to a height of 1.5 m. (a) What fraction of its initial energy is lost during the bounce? (b) What is the ball’s speed just as it leaves the ground after the bounce? (c) Where did the energy go?