Conservation of Mechanical Energy Worksheet

1. An object is released from a height of 11 m. How fast is it travelling at a height of 6.0 m?

2. An object slides down a frictionless 33.0° incline whose vertical height is 14.0 cm. How fast is it going when it reaches the bottom?

3. A bike rider approaches a hill with a speed of 8.5 m/s. The total mass of the bike and rider is 85 kg. Assuming that there is no friction, at what height will the bike come to a stop?

4. A skier starts from rest at the top of a 45.0 m high hill, skis down a 30° incline into a valley, and continues up a 40.0 m high hill.

    a. How fast is the skier moving at the bottom of the valley?

    b. What is the skier's speed at the top of the next hill?

5. Tarzan is running at top speed (8.0 m/s) and grabs a vine hanging vertically from a tall tree in the jungle. How high can he swing upward?

6. In the high jump, with what minimum speed must an athlete leave the ground in order to lift his center of mass 2.20 m and cross the bar with a speed of 0.80 m/s?

7. A car starts off from rest on a hill 40.0 m high.

    a. How fast is it going at the bottom of the hill?
    b. At what height will it have half its final speed?

8. Balls A, B, and C are thrown from the top of a cliff with the same initial speed. Ball A is thrown vertically upward, ball B is thrown straight down, and ball C is thrown horizontally. Which ball has the greatest speed when it reaches the ground?