

Name: _____

Period: _____ Date: _____

Conservation of Energy

Directions: Read each of the following statements/questions. Answer them correctly and box your final answer.

1. A large chunk of ice with mass 15.0-kg falls from a roof 8.00 m above the ground.
 - a. Find the kinetic energy of the ice when it reaches the ground.

 - b. What is the speed of the ice when it reaches the ground?

2. A bike rider approaches a hill with a speed of 8.50 m/s. The total mass of the bike and rider is 85-kg.
 - a. Find the kinetic energy of the bike and rider.

 - b. The rider coast up the hill. Assuming there is no friction; at what height will the bike come to a stop?

 - c. Does your answer depend on the mass of the bike and rider? Explain.

3. Tarzan, mass 85-kg, swings down from a tree limb on the end of a 20 m vine. His feet touch the ground 4.0 m below the limb.
 - a. How fast is Tarzan moving when he reaches the ground?

 - b. Does your answer depend on Tarzan's mass?

 - c. Does your answer depend on the length of the vine?

4. A skier starts from rest at the top of a 45.0 m hill; skis down a 30.0° incline into a valley, and continues up a 40 m hill. Both hill heights are measured from the valley floor. Assume you can neglect friction and the effects of ski poles.
 - 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. A 98-N sack of grain is hoisted to a storage room 50 m above the ground floor of a grain elevator.
- How much work was required?
 - What is the potential energy of the sack of the grain at this height?
 - The rope being used to lift the sack of grain breaks just as the sack reaches the storage room. What is the kinetic energy does the sack have just before it strikes the ground floor?
6. A 20-kg rock is on the edge of a 100 m cliff.
- What potential energy does the rock possess relative to the base of the cliff?
 - The rock falls from the cliff. What is the kinetic energy just before it strikes the ground?
 - What speed does the rock have as it strikes the ground?
7. An archer puts a 0.30-kg arrow to the bowstring. An average force of 201 N is exerted to draw the string back 1.30 m.
- Assuming no frictional loss, with what speed does the arrow leave the bow?
 - If the arrow is shot straight up, how high does it rise?
8. A physics book, mass unknown, is dropped 4.50 m. What speed does the book have just before it hits the ground?