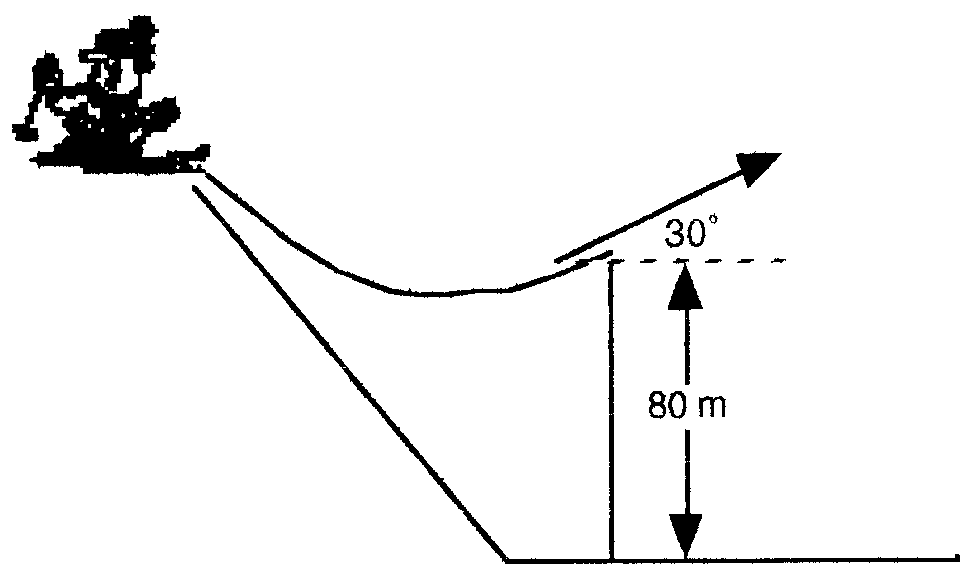
PS 4

1. A large icicle of mass 9 kg hangs from a roof 11 m above the ground.
   1. How much potential energy does it have?
   2. If it breaks off, how much kinetic energy will it have as it strikes the ground?
   3. What will be its final speed as it lands?
2. A golfer misses a putt and throws his golf club straight up into the air in frustration. His putter has a mass of 7 kg and it leaves his hands at 10 m/s.
   1. What is the kinetic energy of the putter as it leaves his hands?
   2. What is the maximum height the putter reaches?
   3. What is the speed of the putter when it is halfway to its maximum height?
3. A girl sets a volley ball straight up in the air with an initial speed of 5 m/s.
   1. How high above her hands does it go?
   2. How fast is the ball moving when it is 0.4 m above her hands?
4. A roller coaster starts from rest at the top of a frictionless track of height 18 m. The car travels to the bottom of the hill and continues up the next hill that is 10 m high.
   1. How fast is the roller coaster traveling at the bottom of the first hill?
   2. How fast is the roller coaster traveling at the top of the 10-m hill?
5. A 60-kg skier leaves the end of a ski jump with a velocity of 25 m/s at an angle of 30° from the horizontal. The ski jump is 80 m above the ground.
   1. What is the skier’s total energy when he leaves the jump?
   2. What is the kinetic energy of the skier when the skier reaches his highest point? (Be careful, it’s not zero!)
   3. What is the maximum height reached by the skier?
   4. What is the skier’s speed just as he lands on the ground below?