A-Day Due Wed., Nov 18
B-Day: Due Thurs., Nov 19

2009 Energy 3

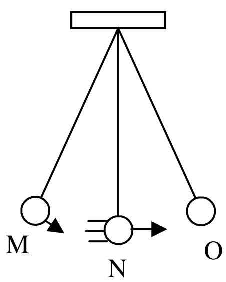
1. What kind of energy: Ep, Ek, PEel, +W, −W, or 0 (no energy).

A. ____ A compressed spring.
B. ____ Friction acting on an object.
C. ____ A moving object.
D. ____ An object above the ground.
E. ____ Making an object go faster.
F. ____ An object at rest on the ground.
G. ____ Slowing down an object.
H. ____ Lowering an object to the ground.

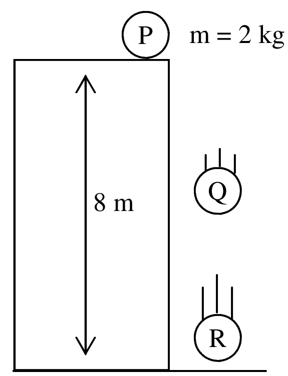
2. Match the Conservation of energy equations at the right with the following situations.

A. ___ An object is thrown into the air. Find how high it goes.
B. ___ An object at rest is moved.
C. ___ A moving object slows down due to friction.
D. ___ An object is dropped. How fast is it going part way down?
E. ___ A spring is compressed.
F. ___ A compressed spring shoots an object into the air.
G. ___ A moving object is stopped.

1. Ek −W = Ek
2. Ep = Ep + Ek
3. Ek = Ep
4. Ek −W = 0
5. PEel = Ek + Ep
6. 0 + W = Ek
7. 0 + W = PEel



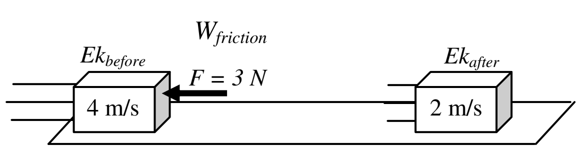
3. Use the pendulum at the left to answer the following.
   A. What kind of energy does it have at M?
   B. What kind of energy does it have at N?
   C. If it has 100 J of energy at M, how much does it have at N?
   D. How does the total energy change as the pendulum swings?



4. Use the diagram at the right to answer the following.
   A. Calculate the object's energy at the top.

   B. How much kinetic energy does it have at the bottom?

   C. How much potential energy does it have at letter Q?



$$\Sigma E_{before} \pm W = \Sigma E_{after}$$

Step 2: $E_k - W = E_k$

Step 3:

Step 4:

Let me walk you thru how to use the Law of Conservation of Energy...

5. A 6 kg object is moving 4 m/s to the right.
   A 3N force slows the object down to 2 m/s.
   I've done steps 1 and 2 for you.
   A. In step 3 put the equations for Ek and W into the equation USING ONLY VARIABLES!
   B. In step 4 put in the numbers that you are given in the problem above (velocities, forces, mass).
   C. Solve for the distance it takes for the object to stop.
   (*This is the same procedure for every Conservation of Energy problem*!)

Use the same process that I just showed you to solve the following problems.

6. A 4 kg object is moving 2 m/s when it is pushed by a 5 N force for 7 m. How fast is it going afterwards?
   A. E_{before} = _____ Work? = _____ E_{after} = _____

   B. Conservation of Energy equation:

   C. Solve.

   C. If the force pushed for 10 seconds, how much power was used to speed up the object?

7. A 3 kg object is moving 2 m/s. It comes to rest by compressing a spring 0.8 meters. Find the spring constant of the spring.
   A. E_{before} = _____ Work? = _____ E_{after} = _____

   B. Conservation of Energy equation:

   C. Solve.

8. A 4 kg object is at rest on the ground. A force accelerates it to 10 m/s in 20 meters. Calculate the force.
   A. E_{before} = _____ Work? = _____ E_{after} = _____

   B. Conservation of Energy equation:

   C. Solve.