A-Day Due Wed., Nov 29 (Assigned: 11/26)
B-Day: Due Thurs., Nov 30 (Assigned: 11/27)

2007 Energy 4

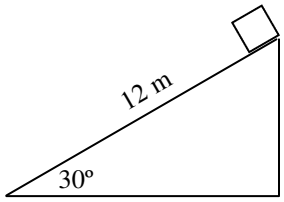
1. Two people are riding bicycles. Person A stops at the bottom of the hill and pushes hard all the way up. Person B starts a long way back and gains speed, coasting all of the way up.
   A. Both bikers have what kind of energy after they climb the hill?
   B. What kind of energy did Person A use to get up the hill?
   C. What kind of energy did Person B use to get up the hill?
   Notice: Person B transferred energy!

2. An object is at rest on a ledge 25 meters above the ground. If it is pushed off the ledge, how high above the ground will it be going 20 m/s?

   A) E_{before} = _____ Work? = _____ E_{after} = _____
   B) Conservation of Energy Equation:

   C) Solve for the height.

3. An object slides down a frictionless ramp shown at the right.



   A) E_{before} = _____ Work? = _____ E_{after} = _____
   B) Conservation of Energy Equation:

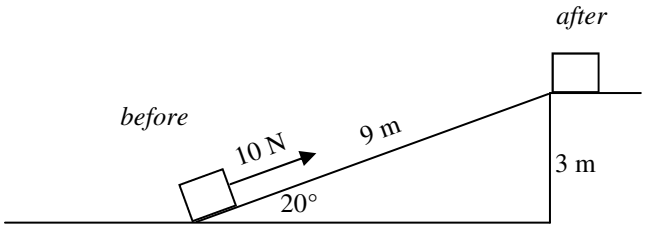
   C) What is the height of the object (*vertical distance, remember*)?

   D) Solve for the velocity at the bottom of the ramp.

4. A spring is compressed 0.3 m and has a spring constant of 35 N/m. If it is released, how fast will it launch a 4 kg object? *(Use the same process as above.)*

Understanding efficiency:

5. A 10 N force pulls a 2 kg object up a 9 m long ramp to get the object to the top of a 3 m tall platform.
   A. Calculate the work done to pull the object up the ramp.



   B. Calculate the potential energy of the object when it is on the table.

   C. Was all of the work transferred to the object?
   D. If energy cannot be created nor destroyed, where did the energy go?

   E. Find the efficiency of the object.

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6. From the song: "*Metals are on the _____ side; nonmetals on the _____. Metals tend to _____ electrons; nonmetals _____ them tight. Losers of electrons become _____; gainers of electrons become _____. Losers and gainers find themselves electrically attracted and they form _____ bonds of love."*

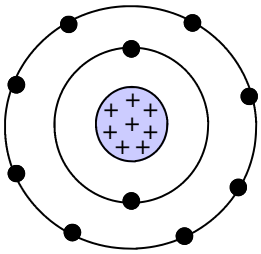
7. Metal or nonmetal?

   A. ____Lithium C. ___ Iron E. ___ Magnesium
   B. ____Helium D. ___ Oxygen F. ___ Nitrogen

8. Give the oxidation numbers for the following:

   A. ____Calcium C. ____Oxygen E. ___ Nitrogen
   B. ____Fluorine D. ____Magnesium F. ___ Sodium

9. Using the graphic of an atom at the right,
   A. How many protons does it have?
   B. What element is it?
   C. How many electrons does it have?
   D. Electrons are positive or negative?
   E. Counting up the positives and negatives, what is the total charge on the atom?



10. If a neutral atom gains 2 electrons, what is it's charge?
11. If a neutral atom loses 3 electrons, what is it's charge?

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