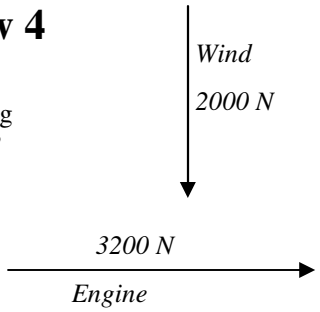
A-Day: Due Thurs., Jan 10 (Assigned: 1/8)
B-Day: Due Fri., Jan 11 (Assigned: 1/9)

2007 Final Review 4

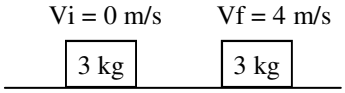
1. A sailboat's engine is pushing with 3200 N due east. If it encounters a wind blowing directly South, how much total force is pushing the sailboat (and in what direction)?



2. There is a net force on an object.
   A. Are the forces balanced or unbalanced?
   B. With the object accelerate?
   C. Is the object at equilibrium?

Since work equals a change of energy, if you know the change of energy, you know the work done on the object.

3. Use the 3 kg object at the right to answer the following.



   A. Find the initial Ek.

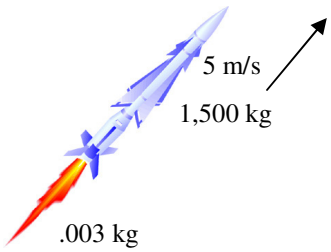
   B. Calculate the final Ek.

   C. Calculate the change of energy.

   D. How much work was done on the object?

   E. If the object was moved 2 m, how much force was applied?

4. A 1,500 kg rocket originally at rest starts its engines. If the rocket ends up moving at a speed of 5 m/s and 0.003 kg of exhaust gas is expelled, how fast is the gas moving?



Distance (m)	0	2.5	5	5.75	12.5
Time (sec)	0.5	1	2	2.3	5

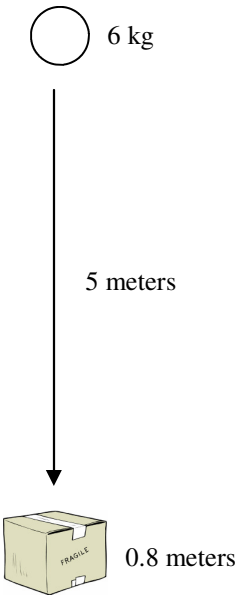
Remembering that average speed equals total distance divided by total speed between two points.

5. The above table shows the motion of an object for 5 seconds.
   A. What is the average speed for the first 2 seconds?

   B. What is the average speed for all 5 seconds?

6. A 6 kg ball is dropped from 5 meters. (*See diagram at the right.)*
   A. How much _____energy does it have at the top?

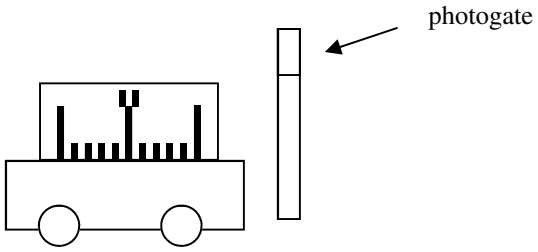
   B. How much _____ energy does it have at the bottom?
   C. How much _____ does it do on the box at the bottom?
   D. How much force does it apply on the box if it stops in 0.8 meters?



LAB QUESTIONS:

7. Change the smart timer display to show what it will look like after you push the "START" button.

8. The following picture shows a cart going thru a photogate. If everything is set up correctly with the timer, why doesn't it read speed of the cart?



9. The following show the timer and triple beam balance from the experiment.
   A. What is the speed of the object in centimeters per second?

   B. What is the mass of the object in grams?

   C. What is the speed of the object in meters per second?

   D. What is the speed of the object in kilograms?

   E. What is the momentum of the cart?

   F. How does the timer show a negative speed?