A-Day: Due Wed., Dec 13 (Assigned: 12/11)
B-Day: Due Thurs., Dec 14 (Assigned: 12/12)

Fall Final 1—Review for Final

Let's make sure we are comfortable with the district's formulas (at the right).

$$P = \frac{F}{A} \qquad P = \frac{W}{t}$$

$$F = ma \qquad d = \tfrac{1}{2}\, a t^2$$

$$F = G\frac{m_1 m_2}{d^2} \qquad W = Fd$$

$$v = \frac{d}{t} \qquad a = \frac{\Delta v}{t}$$

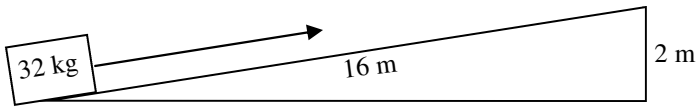
$$Momentum = mv$$

$$impulse = F\Delta t$$

$$v = at \qquad a^2 + b^2 = c^2$$

$$M.A. = \frac{F_o}{F_i} \qquad Efficiency = \frac{W_o}{W_i}$$

1) An 0.12 kg egg, terrified of being dropped just for extra credit (*sheez*!), falls for 2 seconds.
   A) Does it fall farther during the first second or during the second second (did I just repeat myself, repeat myself)? (*Use the equations at the right. This is super easy.)*



2) Use the above ramp to answer the following.
   A) Without the ramp, how far would you have to lift the object?
   B) Is this Dr or De?
   C) With the ramp, how far do you move the object?
   D) If you lifted the object straight up, how much force would you use?
   E) What is the MA of the ramp?
   F) SO, how much force is necessary to move the object up the ramp?

3) An object is at rest. If it has any of the following explain.
   A) Does it have momentum?
   B) Does it have velocity?
   C) Does it have energy?
   D) Does it have acceleration?
   E) Does it have a force?

4) A 20 kg object is on the ground at rest. It is lifted up to a height of 3 meters.
   A) How much energy does it have to begin with?
   B) What kind of energy does it have afterwards?
   C) How did the object get its final energy?
   D) How do the energies in B) and C) compare?
   E) Calculate the work expended to lift the ball.
   F) If the ball was raised in 1.5 seconds. How much power was used?
   G) How much kinetic energy would the object have just before it hits the ground if it was dropped?
   H) A person catches the object just before it hits the ground. If they stop the object in 0.5 seconds, how much force did they need to stop it?

5) A 6 kg box is at rest on the ground.
   A) How much energy does it have?
   B) In order to move it, what do you need to do?
   C) If a person pushes with 20 N for 15 m, how energy do they use to move the object?

   D) What does this energy turn into?
   E) How fast should the object be moving afterwards?

   F) What if the object is only moving 8 m/s? How much energy does it have?

   G) Where did the extra energy go?

   H) Using the amount of energy in C) that you used to move and the amount you got out in F), Find your efficiency.