A-Day: Due Mon., Dec 11 (Assigned: 12/7)
B-Day: Due Tues., Dec 12 (Assigned: 12/8)

Momentum 6—Test Review

Part I—Review for the Momentum Test

First, let's make sure you know what equation (or concept) to use when. You might want to refer to the flowchart or the old homework. (You need to start seeing the similarities.)

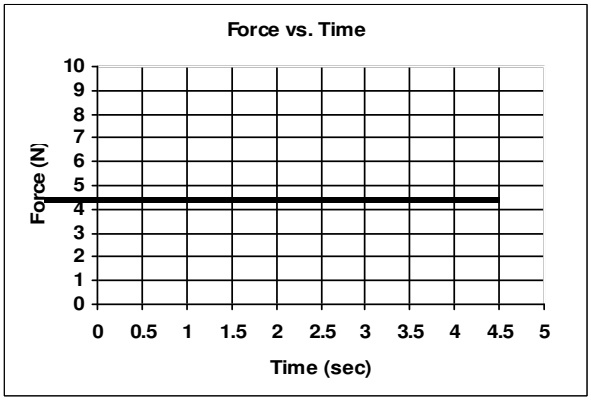
1) If two objects collide, what concept do you use?
2) If there is a force, what concept do you use?
3) If there is a time involved, what concept do you use?
4) Is a force equal to an impulse?
5) Can a small force give a big impulse? Why or why not?

6) A 20 kg ball going 6 m/s is pushed on by a 3 N force. If the final velocity of the ball is 15 m/s, how long did the force act on the ball?

7) What is the change of momentum of the ball?
8) How do the initial and final momentum of the ball compare?
9) What was the impulse on the ball?
10) How long would it take a 10 N force to give the same final velocity to the ball?

11) Use the Graph to answer the following.
    A) Is the object speeding up or slowing down?
    B) How do you know?
    C) What is the change of momentum of the object?

    D) If the object ends up going 20 m/s, how fast was it going beforehand?



Now for collisions…...

12) What kind of collision (elastic, inelastic, perfectly inelastic)?
    A) ____A bullet shot into a target.
    B) ____Two cars collide, do not stay together, and the bumpers of the cars are mangled (badly damaged).
    C) ____Pool balls.
    D) ____Two train cars collide and attach.
    E) ____A ball going 3 m/s hits a wall. When it bounces back it is still going 3 m/s.
    F) ___A ball going 2 m/s hits a wall. When it bounces back it is only going 1.5 m/s.
    (*Could you calculate the change of energy?)*
    G) ___A ball going 2 m/s hits a wall. It gets stuck in a hole in the wall.

    Remember to draw the situations (using boxes—don't get fancy).

13) An 80 kg astronaut (in space, of course) at rest catches a 4 kg box of tools going 5 m/s to the right (*good catch!).* Find the speed of the astronaut afterwards (still holding the box).

14) A 30 kg cart going 6 m/s to the right crashes into a 20 kg cart going 4 m/s to the left. Afterwards the 20 kg cart is going 8 m/s to the right. Find the final velocity of the 30 kg cart.

Gravity stuff: it's heavy, dude! (Or is it?....)

15) A 100 kg satellite is 2.3 x 10^5 m above Jupiter ($m_{Jupiter}$ = 1.9 x 10^{27}; $r_{Jupiter}$ = 7.15 x 10^7 m). What is the force of gravity between these two objects?

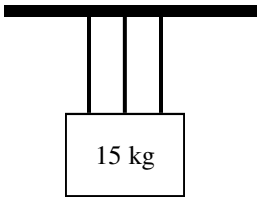
16) Since this satellite is traveling in a circle, what is another name for the force of gravity?

(You have lots of notes to reread and the book and the website. However, what many of you don't do is ***rework*** *the homework. The graded homework is in the room, in the black filing cabinet. If you can do the homework YOURSELF you WILL pass the test. As they say on the announcements: "The choice is up to you.")*

And now to study for the final.

17) When you shoot a projectile (or a throw a ball, or a rock, blah, blah…)
   A) What kind of energy does it have just after you throw it?
   B) What kind of energy is it gaining as it goes into the air?
   C) At the very top of its path (its trajectory), what kind of energy does it have?
   D) What is the vertical velocity of the ball at the very top?
   E) What is the vertical acceleration of the ball at the very top?
   F) For the ball to go as far as possible (have the greatest r_____), at what angle should you throw it?
   G) Will the ball be going faster near the ground or near the top?
   H) As the ball falls back to earth, does the ball's distance increase each second or decrease?
   I) What is the horizontal acceleration of the ball?
   J) Does the acceleration of the ball increase, decrease, or remain constant as it falls?
   K) Does the speed of the ball increase, decrease, or remain constant as it falls?

18) If you push on a wall with 80 N of force, how hard does the wall push on you?
19) How do you know this?
20) A 15 kg object is hanging from 3 ropes. How much force does each rope exert on the object? (*Hint: draw the free-body diagram for the object.*)



From the book (yes, you may now open it)...

21) Find the units for pressure.

22) For a satellite moving around the earth:
   A) What shape is the satellite's orbit (roughly)?
   B) Give three things that don't change as the satellite moves around the earth (*mass is not one*).

23) On planet A, g = 8.5 m/s^2; On planet B, g = 6.8 m/s^2; On planet C, g = 10.1 m/s^2.
   A) What is g on the earth?
   B) What is "g"?

   C) ____ On which planet would you feel the heaviest?
   D) ____ On which planet would you feel the lightest?
   E) ____ On which planet would you feel heavier than on the earth?
   F) ____ On which planet would your mass be greatest?
   G) ____ On which planet would your mass be the least?
   H) ____ On which planet would a golf ball go the farthest when you hit it?
   I) ____ On which planet would "G" be the greatest?
   J) ____ Which planet has the biggest force of gravity?
   K) ____ Which planet "probably" has least mass?

Study hard; redo the homework; do well on the test. If you don't study, then you can freak you, because you won't be ready.

If you need to relax before the test, just say "Red Leather, Yellow Leather" three times fast. Really loosens you up.
"I likes it, my precious."