PreAP: due Wed., Nov 30 (Assigned: Mon., Nov 28)
Reg: due Tues., Dec 1 (Assigned: Tues., Nov 29)

Momentum 3

1) A 6 kg object speeds up from 5 m/s to 20 m/s. Find Δp.

2) A 10 kg object slows down from 25 m/s to 5 m/s. Find Δp.

3) Find the impulse for #1 above:

4) Find the impulse for #2 above:

5) Can an object ever have a negative kinetic energy?

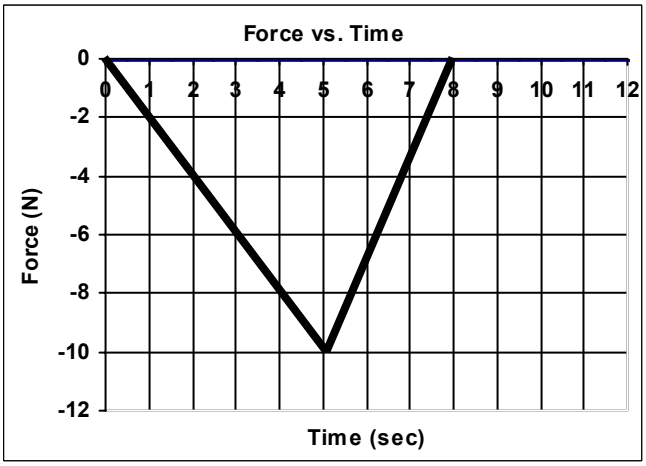
6) Give two ways that a group of objects could have a net momentum of zero:

7) If an object's kinetic energy is zero, what is its momentum?

8) A 75 kg object feels a 8 N force for 10 seconds. Find the impulse on the object.

9) A 2 kg object going 30 m/s feels a -4 N force for 8 seconds, find the object's final velocity.

10) A 20 kg object going 12 m/s feels the impulse shown on the graph. Find the object's final velocity.



11) Why do "crumple zones" (parts of a car that collapse during a crash) keep you safe?

12) Two people originally at rest are on frictionless surface (***wet, oily ice on roller skates, OK?!***). They push off from each other. Answer the following:
A) What was their momentum before?
B) What happens to the two people?

C) If the person on the left is 80 kg and the person on the right is 60 kg, what do we know about how far each will go?

E) According to the Law of Conservation of Momentum, what does the net momentum of the two have to equal afterwards?

D) If the person on the left ends up going 1.2 m/s afterward, find the velocity of the person on the right.

13) An 70 kg person on a 5 kg rolling chair catches a 2 kg ball. Together the person and the ball roll backwards at 3 m/s. Find the net momentum after the ball is caught.

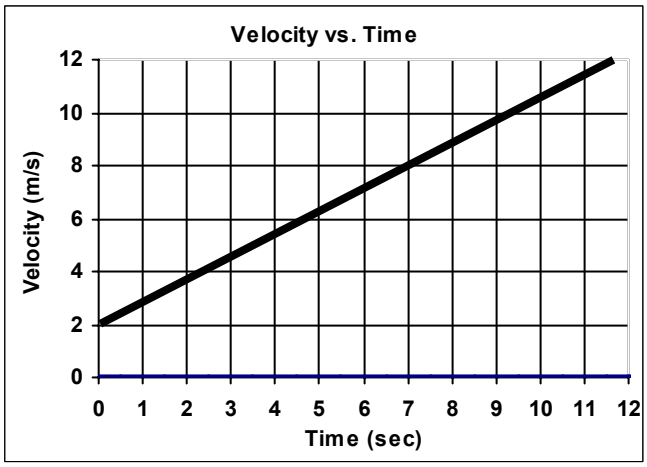
14) Using the graph at the right answer the following:
A) What does the slope of the graph mean?

B) What would the area of the graph mean?

C) What does the y-intercept mean?

D) Which is the independent variable?

E) Find how fast the object was going at 4 seconds.



15) In order to determine how different colors of light affect plant growth a scientist puts 4 plants in boxes that covered in different colors of plastic wrap. Each plant is identical in age, size, health, pot and soil. They are given the same amount of water daily and put in windows around the scientists house. The colors of plastic wrap are: blue, green, red, and clear. Answer the following:

A) Which is the control setup (and why)?

B) Give three control variables.

C) Give the experimental variable.

D) What is your expectation as for the success of the experiment and why.

16) Sugar Maple trees are prized for their sap, a sugary substance that is harvested for syrup.
A) Sugar Maple sap is sugary because it is made up of:

B) The sap is found right under the bark of the Sugar Maple trees in the _____

C) The tree rings of the tree show the growth of the tree over time, this woody substance is the dead _____ of the tree.