2007 Momentum 1

Variable	Units	Variable Name	Notes:
p (small)	kgm/s	momentum	How hard it is to stop something. Can be neg or 0.
I	kgm/s or Nsec	Impulse	Causes a change of p.

$p = mv$
$I = Ft$
$p_{net} = p_1 + p_2...$

1) *Write the above on your variable and equation charts.*

2) A 35 kg object has -450 kgm/s of momentum. Find its velocity.

3) Which has more momentum? (*choose one for each*)
   A. A car when going fast or slow?
   B. A heavy or light object going 10 m/s?

5) Find the momentum of the following objects (remember the above statement):

10 m/s ← [2 kg]   [5 kg] → 50 m/s   [40 kg]

   A. _____   B. _____   C. _____
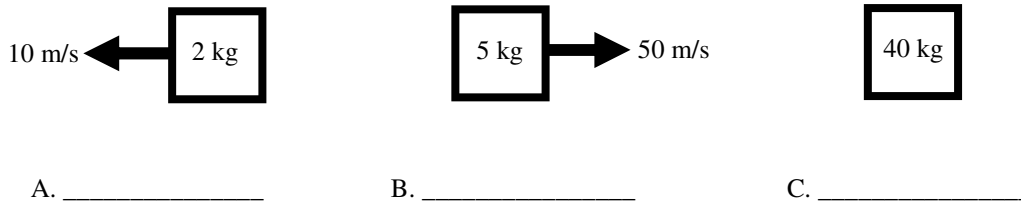
6) Which of the objects in #5 has the momentum with the greatest **magnitude** (*disregarding direction*)?

7) Which of the objects in #5 has the most **inertia**?

8) Find the net momentum of all of the objects in #5 above (*find Σp*).

9) A 10 kg object is 5 m/s moving to the left while a 3 kg object is going 4 m/s to the right.
   (Remember that left is negative.)
   A) Find the momentum of the 10 kg object (we'll call this momentum 1 or "p_1"):

   B) Find the momentum of the 3 kg object (p_2):

   C) Find the net momentum of both objects (Σp).

10) A 25 kg object moving 3 m/s to the right while a 30 kg object is moving 4 m/s to the right (yes, same direction). Calculate p_{net}.

11) A 2 kg object initially going 4 m/s to the right is later going 8 m/s. Find Δv. (Remember that Δ = final – initial.)

12) A 3 kg object going 6 m/s to the right ends up going 3 m/s to the left. Being careful of negatives and positives, find the change of momentum of the object.

13) A 500 N force pushes on an object for 6 seconds.
    A) Find the impulse on the object.

    B) What is the change of momentum of the object?

    C) Since the force is positive, will there be a positive or negative change of speed for the object?

14) How long would it take a 30 N force to get the same impulse as in Q13?

15) So do you have to use a big force to make a big impulse?

16) Positive or negative change of speed? (*Think of a number line. [mmmmm, number lines]*)

    A) _____ Vi = 3 m/s; Vf = -5 m/s

    B) _____ Vi = 5 m/s; Vf = -3 m/s

    C) _____ Vi = -3 m/s; Vf = -5 m/s

    D) _____ Vi = 3 m/s; Vf = 5 m/s

    E) _____ Vi = -5 m/s; Vf = -3 m/s