HW 1

Due October 5, 2007

Please answer all questions clearly and concisely. While you need not transcribe the question completely, it should be clear from your answer alone what you are talking about.

You are strongly encouraged to discuss the homework with your classmates, but you must complete the written homework by yourself, and of course, the material you submit must be your own.

Remember, show all of your work!

1) Let's do some work with vectors. You have the following vectors:

$$\begin{aligned} \vec{u} &= <3, 4> \\ \vec{v} &= <-2, 1> \end{aligned}$$

Compute the following:

a. $3\vec{u}$

b. $2\vec{u} - 3\vec{v}$

c. $\vec{u} \cdot \vec{v}$

d. $|\vec{u}|$

e. What is the angle between $\vec{u}$ and $\vec{v}$.

2) Consider a 2kg block. What is the momentum if the speed is:

a. 10 m/s ?

b. 400 m/s?

c. 2×10^8 m/s

d. 2.9×10^8 m/s

3) Take a 20 kg block. What is the momentum if I apply a force of 100N for:

a. 5s

b. 10^8s (about 3 years!)

c. How fast is the block going after 5 seconds?

d. After 10^8 seconds?

4) 1.HW.95 (in your textbook, naturally)

5) 1.HW.98

6) 1.HW.100