PHYSICS 201
3rd HOMEWORK
Dr. V. Lempesis

Hand in: Tuesday 26th of November 2013

Student Name : _____

Student ID: _____

1. Simplify $\left(\mathbf{u}+\mathbf{v}\right)\times\left(\mathbf{u}-\mathbf{v}\right)$.

2. Verify Cauchy-Schwartz inequality in the following case:
$\mathbf{u}$ = (-3, 1, 0), $\mathbf{v}$ = (2, -1, 3)

3. Find a unit vector in the opposite direction of the vector $\mathbf{v}$ = (-12, -5).

4. Prove that for two vectors $\mathbf{v}=\left(v_1,\ v_2,\ ...,v_N\right)$ and $\mathbf{w}=\left(w_1,\ w_2,\ ...,w_N\right)$ we have:
$\mathbf{v} + \mathbf{w} = \mathbf{w} + \mathbf{v}$.

5. Which of the following vectors of R^6 is parallel to vector $\mathbf{v}$ = (-2, 1, 0, 3, 5, 1):

a) (0, 0, 0, 0, 0, 0) b) (0, 1, 2, 3, 10, 1) c) (-4, 2, 0, 6, 10, 2)

6. Calculate the product $\mathbf{u}\cdot\left(\mathbf{v}\times\mathbf{w}\right)$ for the vectors:

$$\mathbf{v}=3\mathbf{i}-2\mathbf{j}-5\mathbf{k},\ \ \mathbf{v}=\mathbf{i}+4\mathbf{j}-4\mathbf{k},\ \ \mathbf{v}=3\mathbf{j}+2\mathbf{k}$$