Math 265 Quiz # 3	Spring 97–Sec. 01 Dr. Alberto Corso	Name: ____________________ __________________________	Please, be neat and show all your work; circle your answer.

1. In $\mathbf{C}^3$ with the usual inner product find

$$\| \mathbf{v} \| = \sqrt{\langle \mathbf{v}, \mathbf{v} \rangle} \qquad \text{and} \qquad \langle \mathbf{v}, \mathbf{w} \rangle,$$

if $\mathbf{v} = (2, 2+i, 1-2i)$ and $\mathbf{w} = (1+i, 2i, 1)$.

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2. The vectors $\mathbf{u}$ and $\mathbf{v}$ are in $\mathbf{R}^7$ with the usual inner product and we are given that

$$\langle \mathbf{u}, \mathbf{u} \rangle = 3, \quad \langle \mathbf{v}, \mathbf{v} \rangle = 5, \quad \text{and} \quad \langle \mathbf{u}, \mathbf{v} \rangle = -2.$$

Find $\langle \mathbf{u}+\mathbf{v}, 2\mathbf{u}+3\mathbf{v} \rangle$.

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3. Let $\mathbf{u} = (0,1,1)$ and $\mathbf{v} = (1,0,1)$ be vectors in $\mathbf{R}^3$. Find vectors $\mathbf{v}_1$ and $\mathbf{v}_2$ in $\mathbf{R}^3$ such that:

(*a*) $\mathbf{v} = \mathbf{v}_1 + \mathbf{v}_2$;

(*b*) $\mathbf{v}_1$ is parallel to $\mathbf{u}$ and $\mathbf{v}_2$ is perpendicular to $\mathbf{u}$.

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