Math 107, Sect. 250 **Answers to Quiz # 9** **5 Apr '07**

. 5 1. Let $\vec{v} = 2\vec{i} - \vec{j} + 5\vec{k}$. Find the unit vector in the same direction as $\vec{v}$.

Solution. We have

$$|v| = \sqrt{2^2 + (-1)^2 + 5^2} = \sqrt{30}.$$

Thus a unit vector in the same direction as $\vec{v}$ is

$$\vec{w} = \frac{1}{\sqrt{30}}\,\vec{v} = \frac{1}{\sqrt{30}}\left(2\vec{i} - \vec{j} + 5\vec{k}\right).$$

. 5 2. Let $\vec{u} = \langle -4, 2\rangle$ and let $\vec{v} = \langle 2, 2\rangle$.

a. What is $\vec{u} + \vec{v}$?

b. Clearly graph $\vec{u}, \vec{v}$, and $\vec{u} + \vec{v}$ showing the relationship between $\vec{u}, \vec{v}$, and $\vec{u} + \vec{v}$.

Solution. We have

$$\vec{u} + \vec{v} = \langle -4 + 2, 2 + 2\rangle = \langle -2, 4\rangle.$$