Math 321 Quiz 1 (G)

301/302 Feb. 7, 2012

Your Name:

Instructions: This is the quiz for 301/302. (Yes, at last, I'll normalize the quiz scores such that the sections on Tuesday and the sections on Thursday have the same average quiz score.) You have 15 minutes to solve the following problems whithin groups.

1. Consider $V = \{\alpha\vec{a} + \beta\vec{b} \,|\vec{a} = (2,0,0), \vec{b} = (1,2,3)\}$.
   a). What's the dimension of this vector space? (1 pts)
   b). Find an orthonormal basis for this space.(Hint: $\vec{b} - \frac{\vec{a}\cdot\vec{b}}{|\vec{a}|^2}\vec{a}$ is orthogonal to $\vec{a}$) (2 pts)

2. a). Find the value of this expression $\sum_{i=1}^{3}\sum_{j=1}^{3}\delta_{ij}a_{ij}$ where $a_{ij} = i + j$.(2 pts)

   b). Given $\vec{a} = (1,2,3), \vec{b} = (0,1,0), \vec{c} = (0,2,1)$. Check $\vec{a} \times (\vec{b} \times \vec{c}) = (\vec{a}\cdot\vec{c})\vec{b} - (\vec{a}\cdot\vec{b})\vec{c}$ is correct by calculating both sides explicitly. (2 pts)

3. Who helped you most in this quiz? (Write the full name of one single person. You can write your own name.) (1 pt)

4. Your comments on the lectures and discussions till now. (2 pts) (Don't write too much.)