"QUIZ" for Lecture 2

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E-MAIL ADDRESS SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q2FirstLast.pdf) ASAP BUT NO LATER THAN FRIDAY Sept. 11, 8:00pm aa2036@scarletmail.rutgers.edu

1. Determine whether the two vectors are orthogonal and if not, whether the angle between them is acute or obtuse. **a**. $\langle 1, 1, 1\rangle$, $\langle 3, -2, -1\rangle$.

b. $\langle 4, 3\rangle$, $\langle 2, -4\rangle$.

a) $\langle 1,1,1\rangle \cdot \langle 3,-2,-1\rangle = 3-2-1=0 \rightarrow$ vectors are perpendicular

b) $\langle 4,3\rangle \cdot \langle 2,-4\rangle = 8-12=-4 \rightarrow$ vectors aren't perpendicular

since product is negative the angle is obtuse

2. Calculate $\mathbf{v} \times \mathbf{w}$, if

$$\mathbf{v} = \langle 0, 1, -1\rangle \quad , \quad \mathbf{w} = \langle 1, -1, 0\rangle \quad .$$

$$\begin{matrix} i & j & k \\ 0 & 1 & -1 \\ 1 & -1 & 0 \end{matrix} \rightarrow (1\cdot 0-(-1)\cdot(-1))-(0\cdot 0-(-1)\cdot(1))+(0\cdot(-1)-(1\cdot 1))$$

$$= -1-1+(-1) = -1i-1j-1k$$