

## “QUIZ” for Lecture 2

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Section:24

**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 \_\_\_\_\_**

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

**b.**  $(4, 3)$  ,  $(2, -4)$  .

**a.**  $(1, 1, 1) \cdot (3, -2, -1) = 0$  means these two vectors are orthogonal.

**b.**  $(4, 3) \cdot (2, -4) = -4$  means the cosine of the angle between two vectors is a negative number, which means the angle between them is obtuse.

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

$$\mathbf{v} = (0, 1, -1) \quad , \quad \mathbf{w} = (1, -1, 0)$$

$$\mathbf{v} \times \mathbf{w} = \begin{vmatrix} i & j & k \\ 0 & 1 & -1 \\ 1 & -1 & 0 \end{vmatrix} = i \begin{vmatrix} 1 & -1 \\ -1 & 0 \end{vmatrix} - j \begin{vmatrix} 0 & -1 \\ 1 & 0 \end{vmatrix} + k \begin{vmatrix} 0 & 1 \\ 1 & -1 \end{vmatrix} = i(-1) - j(1) + k(-1) = -i - j - k = \langle -1, -1, -1 \rangle$$