

"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 _____

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) $v \cdot w = (1 \cdot 3) + (1 \cdot -2) + (1 \cdot -1) = 3 - 2 - 1 = 0 \quad \therefore \text{orthogonal}$

b) $[4, 3] \cdot [2, -4] = (4 \cdot 2) + (3 \cdot -4) = 8 - 12 = -4 < 0 \quad \therefore \text{obtuse}$

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

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

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

$$= i - j - k$$

$$\mathbf{v} \times \mathbf{w} = [1, -1, -1]$$

