

“QUIZ” for Lecture 2

Wenhao Li 22, 23, 24

NAME: (print!) _____ Section: _____

**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. $\langle 1, 1, 1 \rangle \cdot \langle 3, -2, -1 \rangle = 1 \cdot 3 - 1 \cdot 2 - 1 \cdot 1 = 3 - 2 - 1 = 0$ The dot product is 0, so the angle is orthogonal.

b. $\langle 4, 3 \rangle \cdot \langle 2, -4 \rangle = 4 \cdot 2 - 12 = -4 < 0$ The dot product is less than 0, so the angle is obtuse.

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

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

$$\langle 0, 1, -1 \rangle \times \langle 1, -1, 0 \rangle$$

$$\begin{array}{r} i \quad j \quad k \\ 0 \quad 1 \quad -1 \\ 1 \quad -1 \quad 0 \end{array}$$

$$i \cdot (0 \cdot 0 - 1 \cdot (-1)) - j \cdot (0 \cdot 1 - (-1) \cdot 1) + k \cdot (0 \cdot (-1) - 1 \cdot 1)$$
$$= -i - j - k \text{ or } \langle -1, -1, -1 \rangle$$