

"QUIZ" for Lecture 2

NAME: (print!) Afsana Rahman Section: 23

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)  $\langle 1, 1, 1 \rangle \cdot \langle 3, -2, -1 \rangle = 0$

$$(1 \times 3) + (1 \times -2) + (1 \times -1) = 0$$

$$3 - 2 - 1 = 0$$

$$0 = 0 \quad \checkmark \text{ orthogonal}$$

b)  $\langle 4, 3 \rangle \cdot \langle 2, -4 \rangle = 0$

$$4 \times 2 + 3 \times -4 = 0$$

$$8 - 12 = 0$$

$$-4 \neq 0$$

X NOT orthogonal  
OBTUSE angle

$$2|A||B|\cos\theta = |A|^2 + |B|^2 - |A-B|^2$$
$$2\sqrt{25}\sqrt{20}\cos\theta = 25 + 20 - [(4-2)^2 + (3+4)^2]$$

$$1000\cos\theta = 45 - 53 = -8$$

$$\theta = \arccos\left(\frac{-8}{1000}\right)$$

$$\approx 90.45^\circ$$

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

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

$$\mathbf{v} \times \mathbf{w} = \langle v_2w_3 - w_2v_3, w_1v_3 - v_1w_3, v_1w_2 - w_1v_2 \rangle$$

$$= \langle (1 \cdot 0) - (-1 \cdot -1), (1 \cdot -1) - (0 \cdot 0), (0 \cdot -1) - (1 \cdot 1) \rangle$$

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

$$= \langle -1, -1, -1 \rangle$$