

"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. $\cos \theta = \frac{A \cdot B}{|A||B|}$
 $\cos \theta = \frac{3-2-1}{\sqrt{1+1+1}\sqrt{3+4+1}} = 0$

$\theta = \cos^{-1}(0)$

$\theta = \frac{\pi}{2}$ orthogonal

b. $\cos \theta = \frac{A \cdot B}{|A||B|}$
 $\cos \theta = \frac{8-12}{\sqrt{4^2+3^2}\sqrt{2^2+(-4)^2}}$

$\cos \theta = \frac{-4}{\sqrt{25}\sqrt{20}}$

$\cos \theta = \frac{-4}{5\sqrt{20}}$

$\theta = \cos^{-1}\left(\frac{-4}{5\sqrt{20}}\right)$

$\theta = 1.75$ radians

obtuse angle

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

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

$$\begin{array}{ccc} i & j & k \\ 0 & 1 & -1 \\ 1 & -1 & 0 \end{array}$$

$$\mathbf{A} \times \mathbf{B} = \langle 1 \cdot 0 - (-1)(-1), 1 \cdot (-1) - 0 \cdot 0, 0 \cdot (-1) - 1 \cdot 1 \rangle$$

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