

9/9/20

Quiz for lecture 2

Kwsh Tated

1)

$$a) \langle 1, 1, 1 \rangle, \langle 3, -2, -1 \rangle$$

$$\langle 1, 1, 1 \rangle \cdot \langle 3, -2, -1 \rangle$$

$$3 - 2 - 1$$

$$= 0$$

$$9 + 4 + 1$$

With a  $\cos \theta = 0$  dot product, these vectors are orthogonal.

$$\sqrt{3} \cdot \sqrt{14}$$

$$\theta = 72.02^\circ \text{ Acute angle}$$

$$b) \langle 4, 3 \rangle, \langle 2, -4 \rangle$$

$$\langle 4, 3 \rangle \cdot \langle 2, -4 \rangle$$

$$8 - 12 = -4 \quad \text{Not orthogonal}$$

$$\frac{-4}{\sqrt{16+9} \sqrt{4+16}} = \frac{-4}{5\sqrt{20}} = \cos \theta$$

$$= 100.3^\circ$$

This is an obtuse angle.

$$2) \quad v = \langle 0, 1, -1 \rangle \quad w = \langle 1, -1, 0 \rangle$$

$$v \times w$$

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

$\langle 1, -1, 1 \rangle$  is the cross product

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