

Quiz for lecture 2.

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Section: 8:40 - 10:00 A.M.

Determine whether the two vectors are orthogonal or not. Acute or obtuse.

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

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

So they're orthogonal.

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

$$\langle 4, 3 \rangle \cdot \langle 2, -4 \rangle = 4 \times 2 - 3 \times 4 = -4.$$

So they're not orthogonal

$$\cos \theta = \frac{\langle 4, 3 \rangle \cdot \langle 2, -4 \rangle}{\sqrt{4^2 + 3^2} \cdot \sqrt{2^2 + (-4)^2}} = \frac{-4}{10\sqrt{5}} = -\frac{2}{25\sqrt{5}} < 0$$

So it's obtuse

2. Calculate $V \times W$. $V = \langle 0, 1, -1 \rangle, W = \langle 1, -1, 0 \rangle$.

$$V \times W = \langle \begin{array}{l} \cancel{1 \times 0} - \cancel{1 \times 1} \\ \cancel{0 \times 0} - \cancel{1 \times 1} \\ 1 \times (-1) - 0 \times 0 \end{array}, 0 \times (-1) - \cancel{1 \times 1} \rangle$$

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

