MATH 251: Quiz 1
May 28, 2015

Name: _____

1. Let $\vec{v} = \langle 2, -1, 2 \rangle$ and $\vec{w} = \langle -1, 3, 2 \rangle$. Compute

(a) $3\vec{v} + 2\vec{w}$.

(b) $\vec{v} \cdot \vec{w}$.

(c) $\vec{v} \times \vec{w}$.

2. Find the angle between the vectors $\langle 1, 1, -1 \rangle$ and $\langle 0, 1, 2 \rangle$ as an inverse cosine. Is this angle acute or obtuse?

3. Let $\vec{u} = \langle 2, 3, -2 \rangle$ and $\vec{v} = \langle 1, 1, 1 \rangle$. Decompose $\vec{u}$ into $u_{//} + u_{\perp}$ with respect to $\vec{v}$.

4. Find a vector $\vec{v}$ that is perpendicular to both $\langle 2, 1, 4 \rangle$ and $\langle -2, 6, 1 \rangle$.

Possibly Helpful Formulas:
If $v = \langle a_1, a_2, a_3 \rangle$ and $\vec{w} = \langle b_1, b_2, b_3 \rangle$, then

$$\vec{v} \cdot \vec{w} = a_1 b_1 + a_2 b_2 + = ||\vec{v}|| ||\vec{w}|| \cos(\theta)$$

$$\vec{v} \times \vec{w} = \langle a_2 b_3 - a_3 b_2, a_3 b_1 - a_1 b_3, a_1 b_2 - a_2 b_1 \rangle$$

$$\vec{v}_{//} = \left(\frac{\vec{v} \cdot \vec{w}}{\vec{w} \cdot \vec{w}} \right) \vec{w} \quad \text{and} \quad \vec{v}_\perp = \vec{v} - \vec{v}_{//}$$

for decomposing $\vec{v}$ into components parallel and perpendicular to $\vec{w}$.

How's my teaching so far? I know it's only been 3 days, but just to get some feedback

- Pace of material   Too slow   1   2   3   4   5   Too Fast
- Pace/Clarity of speaking   Too slow   1   2   3   4   5   Too Fast
- Legibility of handwriting   Bad   1   2   3   4   5   Good
- Any other comments?