Checkpoint: Vector operations

Let $\mathbf{v} = \langle 1, 0, 3 \rangle$, $\mathbf{w} = -3\mathbf{i} + 7\mathbf{j} + \mathbf{k}$, and $\mathbf{u} = \langle 2, 2, 2 \rangle$.

(a) Compute $\mathbf{v} \cdot \mathbf{w}$. What does your result mean about $\mathbf{v}$ and $\mathbf{w}$?

(b) Find the angle between $\mathbf{v}$ and $\mathbf{u}$.

(c) Find a **unit** vector that is perpendicular to both $\mathbf{w}$ and $\mathbf{u}$.
(You can use Wolfram Alpha or whatever to streamline any boring computations.)