1. (8pts) Let $\mathbf{u} = \langle 3, 1, -4 \rangle$, $\mathbf{v} = \langle -2, 2, 1 \rangle$. Compute the following.
   a. $\mathbf{u} \cdot \mathbf{v}$
   
   b. Find the angle between vectors $\mathbf{u}$ and $\mathbf{v}$.
   
   c. $\text{Proj}_v(\mathbf{u})$ and $\text{Comp}_v(\mathbf{u})$
   
   d. Determine if $\mathbf{u}$ and $\mathbf{v}$ are orthogonal or parallel or neither.
   
   e. Give a vector which is orthogonal to $\mathbf{u}$.

2. (2pts) Vectors $\mathbf{u}$ and $\mathbf{v}$ in space are given below. Sketch $\text{Proj}_v(\mathbf{u})$ and $\text{Proj}_\mathbf{u}(\mathbf{v})$. 

   \[ \text{Proj}_v(\mathbf{v}) \quad \text{Proj}_\mathbf{u}(\mathbf{u}) \]