# Question:

1. (3 marks) Find a unit vector $\vec{\mathbf{v}} \in \mathbb{R}^3$ orthogonal to both (3,2,1) and (1,2,3)

2. (2 marks) Suppose that $\{\vec{u}, \vec{v}, \vec{w}\} \subseteq \mathbb{R}^2$ is a set of vectors of length 2 which are pairwise orthogonal. Let $\vec{z} = c\vec{u} + b\vec{v} + a\vec{w}$ where $a > b > c > 0$ Which number out of $\vec{u} \cdot \vec{z}$, $\vec{v} \cdot \vec{z}$, and $\vec{w} \cdot \vec{z}$ is the largest? Explain. **Hint:** Orthogonality