Math 233 - Quiz 3

Name _____

September 4, 2025

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) Find a unit vector that is orthogonal to both $\vec{v} = 5\hat{\imath} - \hat{\jmath} + 3\hat{k}$ and $\vec{w} = -2\hat{\imath} - 4\hat{\jmath} + 2\hat{k}$.

2. (2 points) Find the projection of $\vec{v} = 3\hat{\imath} - 4\hat{\jmath} - 3\hat{k}$ onto $\vec{w} = \hat{\imath} + 6\hat{\jmath} + 2\hat{k}$.

3. (1 point) For vectors $\vec{x}$ and $\vec{y}$, explain why you should not expect $\text{proj}_{\vec{y}}\,\vec{x}$ and $\text{proj}_{\vec{x}}\,\vec{y}$ to be equal.

4. (2 points) Find a set of parametric equations for the line passing through the two points $A\,(4, -9, 2)$ and $B\,(7, 3, 1)$.

5. (2 points) A line is described by the equations $\dfrac{2x-4}{5} = \dfrac{3-y}{4} = z + 6$. Determine a point on the line and a vector parallel to the line.