

1. Let $\mathbf{v} = \langle 1, 3, 2, 5, 6 \rangle$ and $\mathbf{u} = \langle 3, -2, -1, 0, 9 \rangle$, compute $2\mathbf{u}$, $\mathbf{u} + \mathbf{v}$ and $\mathbf{u} \cdot \mathbf{v}$.

2. Given $\mathbf{v} = \langle x, 1, 9, 2 \rangle$. Find x such that \mathbf{v} is orthogonal to $\langle x, 0, -1, 0 \rangle$.

3. Decide if the following statement is true or false, if false give a counterexample:
If $\mathbf{v} \cdot \mathbf{w} = \mathbf{v} \cdot \mathbf{u}$ then $\mathbf{u} = \mathbf{w}$.

4. Let $P(0, 0, 1)$ and $\mathbf{n} = [1, 2, 3]$ be a point of a vector.

(a) Find the equation of the plane perpendicular to \mathbf{n} and passing through P .

(b) Find the parametric equations of the line perpendicular to the plane.