Linear Algebra Homework

Your Name

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Exercise 1

Problem: Show that the basis vector $\hat{k}$ is orthogonal to both $\hat{i}$ and $\hat{j}$.

Solution: If a vector $\vec{a}$ is orthogonal to another vector $\vec{b}$, then $\vec{a} \cdot = 0$.

Exercise 2

Problem: Compute the dot product of the following vectors: $\mathbf{a} = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$ and $\mathbf{b} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$.

Solution:

$$\mathbf{a} \cdot \mathbf{b} = (2)(1) + (-1)(4) = 6 - 4 = 2$$