

Quiz 3

(1) [5pts] Use the cross product to find the sine of the angle between $u = 2i + j + k$ and $v = -3i + 2j - 2k$. You may leave radicals.

Answer:

(2) [5pts] Find the (implicit) equation of a plane through point $P = (3, 4, 5)$ with normal vector $n = (1, 0, -5)$.

Answer:

(3) [10pts] Are the following vector spaces or not? Circle those that are, X through those that aren't. (everything is with its usual addition and scalar multiplication)

(a) $\{(x, y) : y \leq 0; x, y \in \mathbb{R}\}$

(b) The set of matrices of the form $\begin{pmatrix} 1 & 2\alpha \\ \beta & 0 \end{pmatrix}$ $\alpha, \beta \in \mathbb{R}$

(c) The subset of matrices in $V = M_{nn}$ which are diagonal matrices

(d) The set of continuous functions on $[0, 1]$ such that $f(1) = 1$

(e) The set of polynomials $ax^5 + bx^3 + cx + d$ where $a, b, c, d \in \mathbb{R}$