

1. True or False?

For any vector space V , the vector space $\mathcal{L}(\mathbf{F}^2, V)$ is isomorphic to the product $V \times V$.

2. Let $V = \mathcal{P}(\mathbf{R})$ and regard $U = \mathcal{P}_2(\mathbf{R})$ as a subspace of V . Then...

- (A) $\dim V/U = 2$.
- (B) $\dim V/U = 3$.
- (C) V/U is infinite dimensional.
- (D) None of the above.

3. True or False?

Suppose V is a vector space and v_1, v_2, v_3, v_4 is a basis for V and let $U = \text{span}(v_1, v_2)$. Then $v_3 + U, v_4 + U$ is a basis for V/U .