1. Consider the following list of length 2 in **C**.

$$(1 - i, 1 + i)$$

This list is...

(A) linearly dependent when **C** is regarded as a vector space both over **C** and over **R**.

(B) linearly dependent when **C** is regarded as a vector space over **C**, but linearly independent when **C** is a regarded as a vector space over **R**.

(C) linearly independent when **C** is regarded as a vector space over **C**, but linearly dependent when **C** is a vector space over **R**.

(D) linearly independent when **C** is regarded as a vector space both over **C** and over **R**.

2. True or False?

Suppose u, v, w is a basis of V. Then

$$u + v, v + w, w$$

is also a basis of V.

3. True or False?

Suppose $p_1, \ldots, p_m$ is a list of polynomials in $\mathcal{P}(\mathbf{F})$ no two of which have the same degree. Then the list is linearly independent.

4. True or False?

There exists a basis of $\mathcal{P}_3(\mathbf{F})$ consisting of polynomials none of which have degree 2.

5. True or False?

If v_1, v_2, v_3 is a basis of V and U is a subspace of V such that $v_1 \in U$ but $v_2, v_3 \notin U$, then v_1 is a basis of U.