Quiz: Chapter 4 (A)

Name: ___________________________ Signature: ___________________________

SHOW ALL YOUR WORK!

In the following \( v_1, v_2, \ldots, v_p \) are vectors in a nonzero vector space \( V \), and \( S = \{v_1, \ldots, v_p\} \). Mark each statement as True or False.

- ( ) The set of all linear combinations of \( v_1, v_2, \ldots, v_p \) is a vector space.
- ( ) If \( \{v_1, v_2, \ldots, v_{p-1}\} \) spans \( V \) then \( S \) spans \( V \).
- ( ) If \( \{v_1, v_2, \ldots, v_{p-1}\} \) is linearly independent then so is \( S \).
- ( ) If \( S \) is linearly independent then \( S \) is a basis for \( V \).
- ( ) If \( \text{span} \ S = V \), then some subset of \( S \) is a basis for \( V \).
- ( ) If \( \text{dim} \ V = p \) and \( \text{span} \ S = V \), then \( S \) cannot be linearly dependent.
- ( ) If \( \text{span} \ S = V \) and \( \tilde{S} \) is a set of more than \( p \) vectors in \( V \), then \( \tilde{S} \) is linearly dependent.
- ( ) \( \mathbb{R}^2 \) is a two-dimensional subspace of \( \mathbb{R}^3 \).
- ( ) The number of pivot columns of a matrix equals the dimension of its column space.
- ( ) If \( B \) is the standard basis of \( \mathbb{R}^n \), then for every \( x \in \mathbb{R}^n \), \( [x]_B = x \).