Quiz (Chapter 4)

Dr. Abdul-Rahman

Name: ________________________ **Signature:** ________________________

SHOW ALL YOUR WORK!

In the following $\mathbf{v}_1, \mathbf{v}_2, \ldots, \mathbf{v}_p$ are vectors in a nonzero vector space V, and $S = \{\mathbf{v}_1, \ldots, \mathbf{v}_p\}$.
Mark each statement as **True** or **False**.

- (   ) The set of all linear combinations of $\mathbf{v}_1, \mathbf{v}_2, \ldots, \mathbf{v}_p$ is a vector space.
- (   ) If $\{\mathbf{v}_1, \mathbf{v}_2, \ldots, \mathbf{v}_{p-1}\}$ spans V then S spans V.
- (   ) If $\{\mathbf{v}_1, \mathbf{v}_2, \ldots, \mathbf{v}_{p-1}\}$ is linearly independent then so is S.
- (   ) If S is linearly independent then S is a basis for V.
- (   ) If $\operatorname{span} S = V$, then some subset of S is a basis for V.
- (   ) If $\dim V = p$ and $\operatorname{span} S = V$, then S cannot be linearly dependent.
- (   ) If $\operatorname{span} S = V$ 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 $\mathcal{B}$ is the standard basis of $\mathbb{R}^n$, then for every $\mathbf{x} \in \mathbb{R}^n$, $[\mathbf{x}]_{\mathcal{B}} = \mathbf{x}$.