Linear Algebra: Practice Problems

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True or False:

1. For any vector space V over R, there exists exactly one element $a \in R$ such that $ax = x$ for all $x \in V$.

2. The set of non negative functions from $R \to R$ is a vector space over R under standard operations.

3. Subsets of linearly dependent sets are linearly dependent as well.

4. If S is a non empty subset of a vector space V, then span(S) is the smallest subspace of V that contains S.

5. The set $\{sin^2(x), cos^2(x), tan^2(x)\}$ is linearly dependent.

6. If u, v, w are distinct vectors from a vector space V and if $\{u, v, w\}$ are linearly independent, then so are $\{u + v, u + w, v + w\}$