Provide a clear and organized presentation. Prove each of the following or provide a counterexample.

1.   Let V be a vector space for which $V = span\{\bar{v}_1, \bar{v}_2, \ldots \bar{v}_n\}$ and $\bar{v} \in V$. Is $\{\bar{v}_1, \bar{v}_2, \ldots \bar{v}_n, \bar{v}\}$ is a linearly independent set?

2.   Let V be a vector space and $\bar{v} \in V$. Under what conditions is $\{\bar{v}\}$ is a linearly dependent or independent set?

3.   Let V be a vector space and consider $\{\bar{v}_1, \bar{0}\}$. Is $\{\bar{v}_1, \bar{0}\}$ a linearly independent or dependent set?