2018 Fall EECS205002 Linear Algebra

Name: ID:

2018/11/7 Quiz 4

1. Explain the following terms about vector spaces.
   - Subspace:
   - Linear independence:
   - Basis:
   - Dimension:
   - Rank:

2. If U and V are subspaces of $\mathbb{R}^n$, and define

$$U + V = \{\vec{z} | \vec{z} = \vec{u} + \vec{v} \text{ where } \vec{u} \in U \text{ and } \vec{v} \in V\}.$$

- Show that $U + V$ is a subspace of $\mathbb{R}^n$.
- Show that if $U \cup V = \{\vec{0}\}$, then $\dim(U + V) = \dim(U) + \dim(V)$.