

Linear Algebra, EE 10810/EECS 205004

Quiz 1.1 – 1.2

Student ID:; Your Name:

(Dated: September 23rd, 2020)

1. **Definition:** Write down the definition for *Vector Space*, including 8 rules.

2. **Uniqueness:** Prove that for each element \vec{x} in a vector space \mathcal{V} , there exists a *unique* vector \vec{y} , such that $\vec{x} + \vec{y} = \vec{0}$.

3. **Complex numbers field:** Let $\mathcal{V} = \{(a_1, \dots, a_n) : a_i \in \mathcal{R} \text{ for } i = 1, 2, \dots, n\}$. Is \mathcal{V} a vector space over the field of complex numbers \mathcal{C} with the operations of coordinatewise addition and multiplication? If not, how to construct a vector space $\mathcal{V} = \{(a_1, \dots, a_n)\}$ over the field of complex numbers \mathcal{C} ?