

Math 225 Quiz 1

Don't forget to write down clearly your **Name**:

and **Net ID**:

1. True or False (5 points) Mark “T” (True) or “F” (False) in front of each statement.

___ If V is a vector space over \mathbb{R} and $v \in V$ satisfies $2v = 3v$, then $v = 0$.

___ The collection of vectors $\{(a, 1) | a \in \mathbb{R}\}$ is a subspace of \mathbb{R}^2 .

___ Every vector v in a vector space V has a unique additive inverse u such that $u + v = 0$.

___ The set of integers \mathbb{Z} is a subspace of \mathbb{Q} .

___ If V is a vector space, $\text{span}(V) = V$.

2. Linear dependence (5 points). Determine if the following matrices

$$\begin{pmatrix} 1 & 0 \\ 1 & 0 \end{pmatrix}, \quad \begin{pmatrix} 0 & 0 \\ 1 & 1 \end{pmatrix}, \quad \begin{pmatrix} 0 & 1 \\ 0 & 1 \end{pmatrix},$$

are linearly independent or not in the space $M_{2 \times 2}(\mathbb{C})$. Justify your answer.