MATH 121A Prep: Subspaces

1. Let $\vec{v} \in \mathbb{R}^n$, and define $span(\vec{v}) = \{c\vec{v} : c \in \mathbb{R}\}$. Show that $span(V)$ is a subspace of $\mathbb{R}^n$.

2. Explain why $\{(x, y) \in \mathbb{R}^2 : xy = 0\}$ is not a subspace of $\mathbb{R}^2$.

3. Let A be an $m \times n$ matrix and $W = \{A\vec{v} : \vec{v} \in \mathbb{R}^n\}$. Is W a subset of $\mathbb{R}^n$ or $\mathbb{R}^m$? Show that W is in fact a subspace.