Mathematics 189-133B, Winter 2003
Vectors, Matrices and Geometry
Written Assignment 3, due in class, Friday, February 14 (♡), 2003

1. Let $S = \{\vec{v}_1, \ldots, \vec{v}_k\}$ be a set of vectors in $\mathcal{R}^n$, and $\vec{w}$ any vector in $\mathcal{R}^n$. Show that $\vec{w} \in span(S)$ if and only if $span(S \cup \{\vec{w}\}) = span(S)$.

2. Suppose that $S = \{\vec{v}_1, \ldots, \vec{v}_k\}$ is a set of vectors in $\mathcal{R}^n$, $\vec{w} \in span(S)$, but $\vec{w} \notin span\{\vec{v}_1, \ldots, v_{k-1}\}$ Show that $\vec{v}_k \in span\{\vec{v}_1, \ldots, \vec{v}_{k-1}, \vec{w}\}$.