Math 108A - Home Work # 3

Due: April 22, 2009

1. Exercises 1, 2, 8, 9 on p. 35 in LADR.

2. Let $v_1, \ldots, v_m$ and u be vectors in a vector space V. Show that

$$u \in span(v_1, \ldots, v_m) \;\Leftrightarrow span(v_1, \ldots, v_m, u) = span(v_1, \ldots, v_m).$$

3. Suppose that $U_1, \ldots, U_m$ are subspaces of a vector space V such that $V = U_1 + \cdots + U_m$. Show that $V = U_1 \oplus \cdots \oplus U_m$ if and only if *every* set $\{u_1, \ldots, u_m\}$ of nonzero vectors with $u_i \in U_i$ for all i is linearly independent.