Name:

Solve **one** of the following two questions:

1. Suppose $T \in \mathcal{L}(V, W)$ and $v_1, v_2, \ldots, v_m$ are vectors in V such that the vectors $Tv_1, Tv_2, \ldots, Tv_m$ are linearly independent in W. Prove that the vectors $v_1, \ldots, v_m$ are linearly independent in V.

2. Suppose that the vectors $v_1, \ldots, v_m$ span the vector space V, and that $T : V \to W$ is a linear transformation. Prove that the vectors $Tv_1, \ldots, Tv_m$ span range T.

Total: 10 points