Additional Problems Assignment 20

1. Let V_1 and V_2 be vector spaces and $T : V_1 \to V_2$ be a linear transformation. Show $\text{Im}(T)$ is a subspace of V_2.

2. Suppose V is a vector space and $\mathcal{B}$ is a basis. Show for $f, g \in V$ and $k \in \mathbb{R}$:

   (a) $[f + g]_{\mathcal{B}} = [f]_{\mathcal{B}} + [g]_{\mathcal{B}}$

   (b) $[kf]_{\mathcal{B}} = k\,[f]_{\mathcal{B}}$