1 Linear Maps

1.1 The Vector Space of Linear Maps

Definition: Linear Map

A **linear map** from V to W is a function $T : V \to W$ with the following properies:

- **Additivity:** $T(u + v) = Tu + Tv$ for all $u, v \in V$;
- **Homogeneity:** $T(\lambda v) = \lambda Tv$ for all $\lambda \in \mathbf{F}$ and $v \in V$.

The set of all linear maps from V to W is denoted $\mathcal{L}(V, W)$.