

Consider, as usual, $\mathcal{L}(V, W)$ to be the space of all linear transformations from vector space V to vector space W . Let $v \in V$ be fixed and define $\psi_v : \mathcal{L}(V, W) \rightarrow W$ via $\psi_v(T) \doteq T(v)$ for all $T \in \mathcal{L}(V, W)$. Is $\psi_v \in \mathcal{L}(\mathcal{L}(V, W), W)$? If so, prove it, if not provide a counterexample.