

Theorem 5.75. *Let $S, T \in \mathcal{L}(V)$ commute and $\lambda \in F$. Show that $E(\lambda, S)$ is invariant under T .*

Proof. For any $v \in E(\lambda, S)$, $STv = TSv = T\lambda v = \lambda Tv$, thus $Tv \in E(\lambda, S)$. □