Let V be a finite dimensional real inner product space and suppose that $T : V \to V$ is a symmetric linear operator with only 2 eigenvalues, $\lambda_1, \lambda_2 \in \mathbb{R}$, $\lambda_1 \neq \lambda_2$. Prove that $p(T) = 0$ where $p(\lambda) \doteq (\lambda - \lambda_1)(\lambda - \lambda_2)$. Give a counterexample to this statement for when the operator is *not* symmetric.