Math 132 - HW 16

Let V be a finite dimensional inner product space and T a linear operator on V.

(a) Prove that $\text{null}(T^*T) = \text{null}(T)$.

(b) Prove that $\dim \text{null}(T^*) = \dim \text{null}(T)$.

(c) Prove or give a counterexample: $\text{null}(T^*) = \text{null}(T)$.

(d) Use part (b) to show that $\lambda \in \mathbb{F}$ is an eigenvalue of T if and only if $\bar{\lambda}$ is an eigenvalue of T^*.