

Suppose  $T \in \mathcal{L}(V)$  and  $\lambda \in \mathbb{F}$ . Prove that  $\lambda$  is an eigenvalue of  $T$  iff  $\bar{\lambda}$  is an eigenvalue of  $T^*$ .

Given  $\bar{\lambda}$  is an eigenvalue of  $T^*$ , show that  $\lambda$  is an eigenvalue of  $T$ . This will imply both directions, since  $\lambda = \overline{\bar{\lambda}}$