Let T be a linear transformation $T : V \longrightarrow V$, that is W-invariant for some subspace W

(1) Suppose T is invertible. Show that $(\bar{T})^{-1} = \overline{T^{-1}}$.
(2) Show that T^t is W^0-invariant (don't assume invertible anymore).

Let S be a linear transformation $S : V \longrightarrow W$

(1) Show that if S is injective then S^t is surjective.
(2) Show that $\ker T^t = (\operatorname{im} T)^0$.