Friedrichs

Step 4

$A^{-1} \subset T'$

$u \in \mathcal{D}(T)$, $v \in \mathcal{H}$

$(Tu, Av) = (Tu, \underbrace{J^* v}_{\text{in } \mathcal{K}}) = (u, J^* v)'$

$= (Ju, v) = (u, v)$

$\Rightarrow Av \in \mathcal{D}(T^*)$, $T^* A v = v$

$Av = J(J^* v) \in \mathcal{K}$

$\Rightarrow Av \in \mathcal{D}(T')$ so $\mathcal{D}(A^{-1}) = \operatorname{Ran} A \subset \mathcal{D}(T')$.

But A^{-1} is s.a. ext. $\Rightarrow$ max symm.

T' is symm.

$(T'u, v) = (u, v)' = \overline{(v, u)'} = \overline{(T'v, u)}$

$= (u, T'v)$