

① Prove that if $Y \subset X$ & X is a HW
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 $T_{3.5}$ space, then Y (with the subspace topology!) is $T_{3.5}$.

② [Grad only] Prove that if X_α is completely regular for each α in a set J , then $\prod_{\alpha \in J} X_\alpha$ (with the product topology!) is completely regular.

③ Prove that if X is Hausdorff and locally compact, then X is $T_{3.5}$.

For (3), you may assume the following well-known "Pasting Lemma":

If X & Y are spaces, A & B are subspaces of X , A & B are closed subsets of X , $A \cup B = X$, $f: A \rightarrow Y$ & $g: B \rightarrow Y$ are continuous, and $f(p) = g(p)$ for all $p \in A \cap B$, then $f \cup g$ is a continuous function from X to Y .

don't

(Comment: You [^] need this for (3), but the Pasting Lemma is also true for A, B open instead of closed.)