

Writing Assignment 9

Due Friday, October 23, 11:59 PM

This is secretly asking you for a proof, but you may treat it as a writing assignment if that helps you think through the problem better.

Let $A \subset X$ and fix an equivalence relation $R \subset X \times X$. Note (no need to prove this, but you may want to understand this) that $R \cap A \times A$ is an equivalence relation on A . We let X/\sim and A/\sim be the resulting quotients.

We can endow A with the subspace topology, then induce the quotient topology on A/\sim . Call this topology \mathcal{T} .

On the other hand, A/\sim can be considered a subset of X/\sim , so we can endow A/\sim with the subspace topology inherited from the quotient topology on X/\sim . Call this \mathcal{T}' .

Are \mathcal{T} and \mathcal{T}' the same topology?

Explore, write; explain your thoughts.