

Name:

**Problem 1:** *Let  $X$  be a topological space with topology  $\mathcal{T}$ , and let  $Y$  be a subset of  $X$ . Give the definition of the subspace topology on  $Y$ .*

**Solution:** The subspace topology on  $Y$  contains exactly the following open sets:

$$\{Y \cap U \mid U \in \mathcal{T}\}.$$