

Name:

Problem 1: *Let X be a set. A topology on X is a collection \mathcal{T} of subsets of X having three properties. What are those three properties?*

Solution: The properties are:

1. \emptyset and X are in \mathcal{T} ;
2. the union of the elements of any subcollection of \mathcal{T} is in \mathcal{T} ; and
3. the intersection of the elements of any finite subcollection of \mathcal{T} is in \mathcal{T} .