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Contents

1 Topological Spaces

Definition 1. *A topology on a set X is a collection $\mathcal{T}$ of subsets of X having the following properties:*

1. *$\emptyset$ and X are in $\mathcal{T}$.*

2. *The union of elements of any subcollection of $\mathcal{T}$ is in $\mathcal{T}$.*

3. *The intersection of the elements of any finite subcollection of $\mathcal{T}$ is in $\mathcal{T}$.*

Any set X for which a topology $\mathcal{T}$ has been specified is called a topological space. An open set is any set U that belongs to the collection $\mathcal{T}$. We can observe that $\emptyset$ and X are both open sets.

Suppose X be any set then $\{\emptyset, X\}$ is a topology. This topology is often called the indiscrete topology. The power set $P(X)$ is also a topology. The power set is called the discrete topology over X.

2 Continuous Functions

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