Topology

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1.1 Topological Space Axioms

Definition 1 (Topological Space)**.** A topological space is an ordered pair $(X, \mathcal{T})$, where $\mathcal{T} \subset \mathcal{P}(X)$, satisfying:

1. $\varnothing$ and X are open sets.
2. The union of any family of open sets is open.
3. The intersection of any finite family of open sets is open.

Where we say a subset of X is open if it belongs to $\mathcal{T}$.