TOPOLOGICAL SPACE

Mathematically, topological space is generalization of Euclidean space,,(a space in any finite numbers of dimensions in which points are designated by the coordinate and the distance between two points is given by a distance formula), in which the idea of closeness or limits is described in terms of relationships between sets rather than in terms of distance, alternatively.

Topological space can be define by the use of sets which it's consist of;- a set of points, class of subset and the set operations of union and intersection,

for instance, let take like we are given two sets, **f** and **h,**

where **f** is a collection of subsets of **h.** and **f** has the following properties: the empty set and h are both in in f, any finite or infinite union of sets in f is itself in f and any finite intersection of sets in **f** is itself in **f** then the ordered pair (**h , f**) is the topological space.

A set is define as an element of topology, a set can either be open or closed, an open set can be open if the union of an arbitrary numbers of open sets are open or the intersection of a finite numbers of open sets are open, and is also directed the a set is closed if its complements is open so we consider **f** as an open set.

A subset of topological space is a compact if every open cover contains a finite sub cover, e.g. a subset **k** of **x** is compact in the topology on the **x** if only **k** is compact as a subset of itself with respect to the relative topology of **k** in **x.**

Example of topological spaces

Every given set may have different topology;

Discrete topology viewed in different topological space in which the subset is open and the only convergent sequences or nets in this topology are those that are constant in nature,

Trivial topology also known as indiscrete its eventually the only empty set and the whole space is open. Its shows that every sequence and net in this topology converges to every point of the space.

Classification of topological spaces

It is classified up to homeomorphism, to prove that two spaces are not are not homeomorphism it is sufficient to find a topological property which is not shared e.g. connectedness, compactness and various separation axioms.