On an experimental topology

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Abstract

Topology is the mathematical study of properties of objects which are preserved through deformations, twisting, and stretching. Tearing, however, is not allowed. A square is topologically equivalent to a circle and a circle is topologically equivalent to an ellipse, into which it can be deformed by stretching. In this work, we discuss the properties of ellipses when an ellipse is continuously subjected to deformation by stretching.

Key words: Set Theory ; Topology ; Fuzzy Topology ; Intuitionistic Fuzzy Topology

MSC : 54A99 ; 54B99 ; 54D99 ; 54E99 ; 54F99 ; 54G99 ; 54G20 ; 54H99

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Experiment

Topology is the study of how spaces are organized, how the objects are structured in terms of position. It also studies how spaces are connected. Topology has sometimes been called rubber-sheet geometry, because in topology of 2 dimensions, there is no difference between a circle and a square (a circle made out of a rubber band can be stretched into a square). Choose a thin elastic rubber sheet. Describe an ellipse on it.**[Figure 1]** Go on stretching as long as possible**.[Figure2]** In figure the stretched ellipse of figure 1 more or less becomes equal to a line segment. If we prolong the stretching process, the ellipse of figure 1 will become a line segment. **See figure 3**

Discussion

So, we have topologically deformed a circle in to an ellipse and an ellipse in to a straight line. Here an abstract idea appears that if we contract a line segment, it may become an ellipse and a circle. Further studies to be devoted in this topic may explore new results. In the above conducted experiment, we have not violated the topological stretching rule**.[1-14]** So, logically our experiment is consistent.

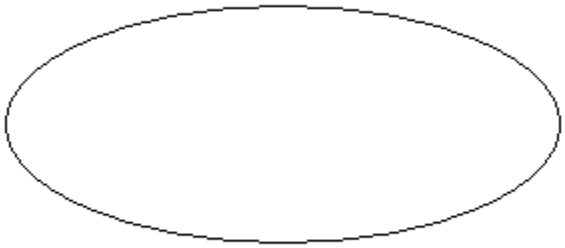

Figure 1

Figure 2

A **Figure 3** **B**

Conclusion

Leonhard Euler is considered the father of and inventor of topology. His 1736 paper on the Seven Bridges of Konigsberg is recognized as one of the first papers on topology. Topology was invented by Henri Poincaré (1850 to 1912) who called it *analysis situs* to handle stability problems in celestial mechanics. He followed, combinatorial methods devised by Leonard Euler (1707 to 1783) who traced the subject back to Leibniz(1646 to 1716) as well as work in differential geometry by Gauss (1777 to 1855) and Riemann (1826 to 1866). Later on, fuzzy topology was introduced by Chang in 1967.By adding the degree of non-membership to FS, Atanassov proposed intuitionistic fuzzy set (IFS) in 1983 which looks more accurately to uncertainty quantification and provides the opportunity to precisely model the problem based on the existing knowledge and observations. After this, there have been several generalizations of notions of fuzzy sets and fuzzy topology. In the last few years various concepts in fuzzy were

extended to intuitionistic fuzzy sets. In 1997, Coker introduced the concept of intuitionistic fuzzy topological space. From Cantor's set to Zadeh's fuzzy set; from fuzzy set to Atanassov's intuitionistic fuzzy set. Set theoretic topology, fuzzy topology and intuitionistic fuzzy topology are the major fields of topologies built on set theory. Zadeh replaced the notion elements by degrees of membership.[0,1] and Atanassov introduced non memberships. Similarly, the transformed ellipses in to line segments may be assumed instead of elements and degrees of memberships to formulate a new branch of topology. Future probes may explore and reveal more and more results.

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