A study on strongly g-closed sets and strongly g**-closed sets in topological spaces

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Abstract
In this dissertation, we study the notions of g-closed sets and g*-closed sets and strongly g*-closed sets. Also, we study strongly g-closed sets and sg**-closed sets in topological spaces and also some examples. And every closed set is strongly g*-closed set. The above theorem is need not be true we explain some examples.

Keywords: g-closed sets, g*-closed sets, strongly g-closed sets, strongly g**-closed sets

Introduction
The word topology derived from two area words, topo’s meaning discovers or study topology thus literally means the study of surface. modern topology depends strongly on the ideas of theory, developed by GEORG CANTOR in the later part of the 19th century during the period up to 1960’s, researchs in the field of general topology flourished and settled many important. Since the 1960’s researches in general topology has moved into several new areas that invoice intricate mathematical tools, including set theoretic methods. In the late 1960’s research worked to generalized some of the topological properties of infinite dimensional Hilbert space.

Maurice freched (1878-1973) was the first to expand topological consider beyond Euclidean space. He introduced metric space in 1960 in a context the permitted one to consider abstract objects and not just real numbers on n tuples of real numbers topology emerged as a concerned discipline in 1914 when Felix hausdroff (1868-1942) published his classical treatise grunzuge Hausdroaff defined topological space in term of neighborhood of members of a set. These concepts where introduce immediately after georg cantor(1845-1918) had developed a general theory of sets in the general theory of sets in the general theory of sets in the 1880’s but even before cantor, Bernard Riemann (1826-1866) had fore seen study of abstract space.

2. Preliminaries
Basic Definitions 2.1
Definition 2.1.1
A topology on a set X is collection τ of a subsets of X having the following properties
1. ∅ and X are in τ.
2. The union of elements of any collection of τ is in τ.
3. The intersection of the elements of any finite sub collection of τ is in τ.
The elements of τ are known as open set and the elements of τ are known as closed set.

Definition 2.1.2
A set X to gether with a topology τ defined on it is called a topological space. And it is denoted by (X, τ).

Definition 2.1.3
Let X be any set. The collection of all subsets of X is a topology on X it is called a Discrete Topology.
Definition 2.1.4
The collection consisting of and is only also a topology on it is called an Indiscrete Topology.

Definition 2.1.5
A subset of of a topological space is said to be open if the set is closed.

Definition 2.1.6
Let be a topological space and let be a subset of .

Definition 2.1.7
Let be a topological space and let be a subset of .

Definition 2.1.8
A subset of a topological space is said to be semi open if is semi open in .

Definition 2.1.9
A subset of a topological space is said to be semi closed if is semi closed in .

Definition 3.1.1
A subset of a topological space is called generalized closed set (briefly g-closed) if is closed and is open in .

Example 4.3.2
Let and . Then is g-closed set.

Theorem 4.1.1: Every closed set is g*-closed set.

Example 4.1.2
Let and . Then is g*-closed set.

Definition 4.1
A subset of a space is called g*-closed set if whenever and is open in .

Theorem 4.1.3
If is g*-closed set, then is g*-closed set.

Definition 4.2.1
A subset of a space is called g**-closed set if whenever and is open in .

Example 4.2.4
Let and . Then is g**-closed set.

Strongly G**-Closed Sets in Topological Spaces 4.2

Strongly G*-Closed Sets and Strongly G**-Closed Sets 4.3

In this chapter, we study the concept of strongly g-closed sets in topological spaces.

Definition 4.3.1:
A subset of a space is called strongly g-closed set if whenever and is open in .

Example 4.3.2:
Let and . Then regular generalized closed set is g**-closed set.

Definition 4.3.3:
A subset of a space is called a generalized g star closed set if whenever is open in .
Example 4.3.4
Let $X=\{a,b,c\}$ and $\tau=\{\emptyset,\{a\},\{c\},\{a,c\},X\}$. then generalized $g$-star closed sets $\{\emptyset,\{b\},\{a,b\},\{b,c\},X\}$.

Definition 4.3.5
A subset $A$ of a space $(X,\tau)$ is called a generalized $g$-star closed (briefly $g^{**}$-closed) set if $cl(A) \subseteq U$ whenever $A \subseteq U$ $U$ is $g^*$ open in $(X,\tau)$

Example 4.3.6
Let $X=\{a,b,c\}$ and $\tau=\{\emptyset,\{a\},\{c\},\{a,c\},X\}$. Then generalized $g$-star star closed sets $\{\emptyset,\{b\},\{a,b\},\{b,c\},X\}$.

References