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θ_{e^*}-OPEN SETS AND θ_{e^*}-CONTINUITY OF MAPS IN THE PRODUCT SPACE

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Abstract. In this paper, we introduce the concept of θ_{e^*}-open set defined using e^*-closure operator. We then investigate the relationship of this set to the other known concepts in topology such as the classical open, θ-open, θ_s-open and θ_e-open sets. We also characterize the concepts of θ_{e^*}-continuous function from an arbitrary topological space into the product space.

1. Introduction and Preliminaries

The notion of open sets lies at the heart of topology. Since then, open sets have been developing from many variations with unique characteristics. In 1963, Levine [16] was the first to initiate and study the concept of semi-open set, semi-closed set, and semi-continuity of a function.

A subset O of a topological space X is semi-open [16] if $O \subseteq Cl(Int(O))$. Equivalently, O is semi-open if there exists an open set G in X such that $G \subseteq O \subseteq Cl(G)$. A subset F of X is semi-closed if its complement $X \setminus F$ is semi-open in X. Let A be a subset of X. A point $p \in X$ is a semi-closure point of A if for every semi-open set G in X containing x, $G \cap A \neq \varnothing$. We denote by $sCl(A)$ the set of all semi-closure points of A.

From this beneficial study onwards, many mathematicians made several attempts in generating new types of open sets to broaden the topology and its purpose in the real physical world.

In 1968, Veličko [22] introduced the concept of θ-continuity between topological spaces and defined the concepts of θ-closure and θ-interior of a set. The study of Veličko was pursued by Dickman and Porter [7, 8], Joseph [14], and Long and Herrington [17]. Moreover, several authors have obtained interesting results related to these sets, see [1, 6, 12, 13, 15, 19].

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