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θ-SOMEWHAT NEARLY-OPEN SETS AND θ-SOMEWHAT NEARLY-CONTINUITY

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Abstract. In this paper, a new class of open set called θ-somewhat nearly-open set is introduced and studied. We then investigate its relation to other well-known types of open sets such as the classical open, θ-open, somewhat-open, and somewhat nearly-open sets in a topological space. Moreover, some characterizations of the notions of θ-somewhat nearly-continuous and strongly θ-somewhat nearly-continuous functions from an arbitrary topological space into the product space are obtained.

1. Introduction and Preliminaries

Numerous mathematicians have been developing different variations of open sets including its weaker and stronger versions. Levine [22] made the first attempt in 1963, when he introduced the concepts of semi-open set, semi-closed set, and semi-continuity of a function.

In 1968, Veličko [31] introduced the concept of θ-continuity between topological spaces as well as the concepts of θ-closure and θ-interior of a set. Several authors then investigated and discovered intriguing results concerning θ-open sets, see [1, 10, 12, 13, 18, 19, 20, 21, 23, 27, 29].

Let $(X, \mathfrak{T})$ be a topological space and $A \subseteq X$. The θ-closure and θ-interior of A are, respectively, denoted and defined by

$$Cl_\theta(A) = \{x \in X : Cl(U) \cap A \neq \varnothing \text{ for every open set U containing } x.\}$$

and

$$Int_\theta(A) = \{x \in X : Cl(U) \subseteq A \text{ for some open set U containing } x.\}$$

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