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A NEW VIEW ON SOFT RINGS

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Abstract

In this paper we study soft rings and ideals. Firstly, we define a new binary relation on soft sets using binary relations on the universe and parameter sets. Then, we introduce the notion of soft ring and soft ideal over a ring, and some examples are given. Also, we obtain some new properties of soft rings and soft ideals. Lastly, we define extended sum, restricted sum, extended product, and restricted product of soft sets, and derive their basic properties.

Keywords: Soft sets, Soft rings, Soft subrings, Soft ring homomorphism, Soft ideals.

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1. Introduction

Many complicated problems in economics, engineering, the environment, social science, medical science and many other fields involve uncertain data. These problems which one come face to face with in life cannot be solved using classical mathematic methods. In classical mathematics, a mathematical model of an object is devised and the notion of the exact solution of this model is determined. Because of that the mathematical model is too complex, the exact solution cannot be found. There are several well-known theories to describe uncertainty. For instance fuzzy set theory [31], rough set theory [26] and other mathematical tools. But all of these theories have their inherit difficulties as pointed out by Molodtsov [25]. To overcome these difficulties, Molodtsov introduced the concept of soft set as a new mathematical tool for dealing with uncertainties that is free from the difficulties affecting existing methods.

The theory of soft sets has rich potential for applications in several directions, few of which had been demonstrated by Molodtsov in his pioneer work [25]. At present, works on soft set theory are making progress rapidly. Maji *et al.* [22] described an application

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