



From Infinite Arrays to Finite Matrices: The Truncated Riordan Group Approach

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Abstract

The $(n + 1)$ -th partial sum of the Maclaurin series expansion of e^x is represented by the truncated exponential polynomials [1], which are expressed as follows:

$$e_n(x) = \sum_{k=0}^n \frac{x^k}{k!}.$$

The structural function of the truncated Riordan group as a strong algebraic framework for the analysis of specific polynomial sequences will be investigated in this study. The formal definition of a truncated polynomial, which offers the required mathematical basis to limit infinite sequences into finite structures, is essential to this investigation. By confirming basic algebraic axioms under a particular operation, we will show how this algebraic step enables a formal transition from infinite-dimensional spaces to manageable finite-dimensional systems.

Keywords: Riordan array, truncated polynomial, double Riordan array.

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