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On a New Class of Multivariable k-Gottlieb Polynomials and Their Analytical Properties

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Abstract

In this paper, we introduce a new class of multivariable k-Gottlieb polynomials as a k-analogue of the classical multivariable Gottlieb polynomials and investigate their fundamental properties. These polynomials are defined via an appropriate generating function, which serves as the main tool for deriving explicit representations. By employing analytic and operational techniques, we establish several key results, including generating function identities and a Mellin transform formula. Furthermore, we obtain various integral representations that provide additional insight into their structural properties. The results presented here extend the theory of multivariable Gottlieb polynomials and contribute to the development of k-special functions.

Keywords: Multivariable k-Gottlieb polynomials, k-analysis, generating function, integral representation.

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