



A Novel Set of Univariate Biorthogonal Polynomials

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Abstract

As is known, biorthogonal polynomials are an extension of orthogonal polynomials and, for some special values, can be reduced to a scalar case. Constructing a biorthogonal structure from scratch is quite difficult because biorthogonality is related to the orthogonality of two different families. So far, four families of one-variable biorthogonal polynomials have been defined in the literature.

In this study, a new class of biorthogonal polynomial families has been defined. In addition to many properties obtained for this family, studies have also been conducted on fractional operators and integral transformations for these polynomials.

Keywords: Biorthogonal polynomial, finite orthogonal polynomial, integral transform.

References:

- [1] H. C. Madhekar and N. K. Thakare, Biorthogonal polynomials suggested by the Jacobi polynomials. *Pacific J. Math.* 100 (1982), no. 2, 417–424.
- [2] M. Masjed-jamei, Three finite classes of hypergeometric orthogonal polynomials and their application in functions approximation. *Integral Transforms Spec. Funct.* 13 (2002), no. 2, 169–191.
- [3] E. Gldođan Lekesiz, Finite biorthogonal polynomials suggested by the finite orthogonal polynomials $M_n^{(p,q)}(x)$. *Math. Methods Appl. Sci.* 49 (2026), no. 11, 12524–12538.