REPRESENTING POLYNOMIALS BY OTHER POLYNOMIALS II

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Abstract

In this talk, we will consider the problem of representing sums of finite products of various polynomials in terms of the sequences of Bernoulli and several orthogonal polynomials.

More specifically, we will represent sums of finite products of Chebyshev polynomials of the first, second, third and fourth kinds, Legendre polynomials, Laguerre polynomials, Fibonacci polynomials, Lucas polynomials, Frobenius polynomials by Bernoulli, Hermite, Legendre, generalized Laguerre, Gegenbauer and Jacobi polynomials.

The representations by Bernoulli polynomials will be done by considering the Fourier series expansions of the periodic functions with period 1 closely related to those sums of finite products. While the representations by several orthogonal polynomials will be done by using formulas obtained by the orthogonalities of those polynomials, and Rodrigues' and Rodrigues-type formulas.

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