
The Askey-Wilson operator is a multiplicative divided difference operator which acts on the most general of the classical orthogonal polynomials as the derivative does for Jacobi polynomials. The authors find a right inverse operator by expanding a function in a series of Chebyshev polynomials of the first kind observing that a related expansion in terms of Chebyshev polynomials of the second kind arises by applying the A-W operator, and then going backwards to get the original series as an integral with a theta function as kernel. The reader should do the corresponding work for the derivative, using both the expansions above and also expansions in terms of \( \sin(n + \frac{1}{2})\theta \) and \( \cos(n + \frac{1}{2})\theta \). Two classical Fourier series result.

Reviewer: R. Askey (Madison)

MSC:

33D45 Basic orthogonal polynomials and functions (Askey-Wilson polynomials, etc.)

42C10 Fourier series in special orthogonal functions (Legendre polynomials, Walsh functions, etc.)

45E10 Integral equations of the convolution type (Abel, Picard, Toeplitz and Wiener-Hopf type)

Keywords:

q-series; divided difference operator; theta function

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References:


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