Sharp estimates for the polynomial approximation in weighted Sobolev spaces

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Abstract

© 2015, Pleiades Publishing, Ltd. We obtain sharp estimates for the accuracy of the best approximation of functions by algebraic polynomials on an interval, the half-line, and the entire line in weighted Sobolev spaces with Jacobi, Laguerre, and Hermite weights, respectively. We show that the orthogonal polynomials associated with these weights form orthogonal bases in the respective weighted Sobolev spaces. We obtain sharp estimates of Markov–Bernstein type.