Amdeberhan, T.; Duncan, Adriana; Moll, Victor H.; Sharma, Vaishavi
Filter integrals for orthogonal polynomials. (English) Zbl 07475398
Hardy-Ramanujan J. 44, 116-135 (2021)

Summary: Motivated by an expression by Persson and Strang on an integral involving Legendre polynomials, stating that the square of $P_{2m+1}(x)/x$ integrated over $[-1,1]$ is always 2, we present analog results for Hermite, Chebyshev, Laguerre and Gegenbauer polynomials as well as the original Legendre polynomial with even index.

MSC:
33C45 Orthogonal polynomials and functions of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.)
33E20 Other functions defined by series and integrals

Keywords:
integrals; Legendre polynomials; Hermite polynomials; Chebyshev polynomials; Laguerre polynomials; Gegenbauer polynomials

Full Text: DOI