

998-42-201

Laura De Carli* (decarli1@fiu.edu), Florida International University, Dept. of Mathematics, Univ. Park, DM Building, Miami, FL 33199. *Uniform estimates of ultraspherical polynomials of large order and applications.* Preliminary report.

We prove the sharp inequality

$$|P_n^{(s)}(x)| \leq P_n^{(s)}(1) \left(|x|^n + \frac{n-1}{2s+1}(1-|x|^n) \right),$$

where $P_n^{(s)}(x)$ is the classical ultraspherical polynomial of degree n and order $s \geq n\frac{1+\sqrt{5}}{4}$. This inequality can be refined in certain intervals of $[-1, 1]$. We use these inequalities to estimate linear combinations of ultraspherical polynomials of large order. (Received February 26, 2004)