

Abstract

Let $x_{n,k}^{(\lambda)}$, $k = 1, 2, \dots, [n/2]$, denote the k th positive zero in increasing order of the ultraspherical polynomial $P_n^{(\lambda)}(x)$. We prove that the function $[\lambda + (2n^2 + 1)/(4n + 2)]^{1/2} x_{n,k}^{(\lambda)}$ increases as λ increases for $\lambda > -1/2$. The proof is based on two integrals involved with the square of the ultraspherical polynomial $P_n^{(\lambda)}(x)$.