Abstract

Let \( x^{(\lambda)}_{n_k}, k = 1, 2, ..., \left\lfloor \frac{n}{2} \right\rfloor \), be the \( k \)th positive zero in decreasing order of the Ultraspherical polynomials \( P^{(\lambda)}_n(x) \). It is proved that the largest zero \( x^{(\lambda)}_{n_1} \) of the polynomials \( P^{(\lambda)}_n(x) \) is a convex function of \( \lambda \) for \( \lambda \geq \frac{n}{\sqrt{3}} + \frac{1}{2}, n \geq 1. \)