

Abstract

We prove the convexity of the largest zero of the q -Lommel and the q -associated Laguerre polynomials as well as the convexity of products of certain functions with the largest zero of the q -associated Laguerre polynomials and associated Al-Salam-Carlitz II polynomials. Moreover as a consequence of our results concerning the q -associated Laguerre polynomials, we extend a recent result regarding the convexity of the function $\frac{1}{\alpha+1}x_{n,1}(\alpha)$, where $x_{n,1}(\alpha)$ is the largest zero of the classical Laguerre $L_n^\alpha(x)$ polynomials. The method we use is a functional analytic one based on the three term recurrence relations that the q -associated polynomials satisfy. By use of this method, the proofs of our results are straightforward.