Results on Toeplitz Determinants for Subclasses of Analytic Functions Associated to q-Derivative Operator

ABSTRACT

An analytic function, also known as a holomorphic function, is a complex-valued function that is differentiable at every point within a given domain. In other words, a function f (z) is analytic in a domain U if it has a derivative f ′ (z) at every point z in U. Let A represent the set of functions f that are analytic within the open unit disk D = {z ∈ ℂ : |z| < 1}. These functions possess a normalized Taylor-Maclaurin series expansion written in the form f (z) = z + Íꝏ n=2 an z n where an ∈ ℂ, n = 2, 3, ... In recent years, the field of q-calculus has gained significant attention and research interest among mathematicians. The applications of this field are broadly applied in numerous subdivisions of physics and mathematics. In this research, we assume that S ∗ q and ℝq are subclasses of analytic functions obtained by applying the q-derivative operator. The objective of this paper is to obtain estimates for coefficient inequalities and Toeplitz determinants whose elements are the coefficients an for f ∈ S ∗ q and f ∈ Rq .