CHARACTERIZATION PROPERTIES FOR STARLIKENESS AND CONVEXITY OF SOME SUBCLASSES OF P-VALENT FUNCTIONS INVOLVING A CLASS OF INTEGRAL OPERATORS

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Abstract

This paper studies the sufficient conditions for the starlikeness and convexity of a class of fractional integral operators of certain analytic and p-valent functions in the open unit disk. Further characterization theorems associated with the Hadamard product (or convolution) are also considered.

Keywords: p-valent function, starlike function, convex function, fractional integral operators, Hadamard product.

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1. Introduction and Definitions

Let \( A(p) \) denote the class of functions defined by

\[
A(p) = \{ f(z) = \sum_{n=1}^{\infty} a_{p+n} z^{p+n} \mid p \in \mathbb{N} \}
\]

which are analytic and p-valent in the open unit disk \( U = \{ z : |z| < 1 \} \). Then a function \( f(z) \in A(p) \) is called p-valent starlike of order \( \alpha \), if it satisfies the conditions

\[
\text{Re} \left\{ \frac{zf'(z)}{f(z)} \right\} > \alpha
\]

and

\[
\int_0^{2\pi} \text{Re} \left\{ \frac{zf'(z)}{f(z)} \right\} d\theta = 2p\pi
\]

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