

Certain new classes of Multivalent Functions of order Alpha and Type Beta

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Abstract: In this paper, a new class $\delta - TS_p(n, q, \alpha, \beta)$ consisting of δ - uniformly starlike, analytic, q -valent functions with negative coefficients of order α and type β and an another new class $\delta - TUC(n, q, \alpha, \beta)$ consisting of δ -uniformly convex, analytic, q -valent functions with negative coefficients of order α and type β are introduced.

Coefficient estimates, distortion theorems, closure theorems and convolution results for functions in these classes are obtained.

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1 Introduction :

Let $T(n, q)$ denote the class of functions of the form

$$f(z) = z^q - \sum_{k=n}^{\infty} a_{k+q} z^{k+q} \quad (a_{k+q} \geq 0; q, n \in \mathbb{N}) \quad (1)$$

which are analytic in the open unit disk $U = \{z \in \mathbb{C}; |z| < 1\}$.

Let us now define two new subclasses $\delta - TS_p(n, q, \alpha, \beta)$ and $\delta - TUC(n, q, \alpha, \beta)$ of $T(n, q)$.

Definition 1. let $\delta - TS_p(n, q, \alpha, \beta)$ denote the class of δ -uniformly starlike, analytic, q -valent functions of order α and type β , satisfying the inequality

$$Re \left\{ \frac{zf'(z)}{f(z)} - \alpha \right\} > \delta \left| \frac{zf'(z)}{f(z)} - \beta \right|, \quad (2)$$

$$(0 \leq \alpha < \beta \leq q; 0 \leq \delta < q; z \in U).$$