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Department of Mathematics						
1	Sumit Nagpal	Coefficient Inequalities for Janowski Starlikeness	Proceedings of the Jangjeon Mathematical Society	March 2016	1598-7264	Scopus
Department of Statistics						
2	Sachin Tomer	Inferences on the Mixture Model with Type II hybrid censored data	Mathematics in Engineering, Science and Aerospace	May 2015	2041-3165	Scopus

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COEFFICIENT INEQUALITIES FOR JANOWSKI STARLIKENESS

SUSHIL KUMAR, SUMIT NAGPAL, AND V. RAVICHANDRAN

ABSTRACT. For $-1 \leq B < A \leq 1$, let $\mathcal{S}^*[A, B]$ and $\mathcal{K}[A, B]$ be the classes of analytic functions f defined in the open unit disk normalized by the conditions $f(0) = f'(0) - 1 = 0$ satisfying the subordination relations $zf'(z)/f(z) \prec (1 + Az)/(1 + Bz)$ and $1 + zf''(z)/f'(z) \prec (1 + Az)/(1 + Bz)$ respectively. The necessary and sufficient coefficient conditions are obtained for normalized analytic functions f of the form

$$\left(\frac{z}{f(z)}\right)^{\mu} = 1 + \sum_{n=1}^{\infty} b_n z^n, \quad \mu > 0$$

to be in the class $\mathcal{S}^*[A, B]$. For such functions, growth, covering and distortion theorems are also proved. In addition, a sufficient coefficient condition is also obtained for such functions to be in the class $\mathcal{K}[A, B]$. Applications of obtained results are also provided. Analogous results are proved for meromorphic rational functions defined in the punctured open unit disk.

2010 MATHEMATICS SUBJECT CLASSIFICATION. 30C45, 30C50, 30C80.

KEYWORDS AND PHRASES. Subordination, Janowski starlike function, convex function, meromorphic function, coefficient inequality, growth and distortion, rational function.

1. INTRODUCTION

Let $\mathcal{A}$ be the class of all analytic functions f in the unit disk $\mathbb{D} := \{z \in \mathbb{C} : |z| < 1\}$ normalized by $f(0) = f'(0) - 1 = 0$ and $\mathcal{S}$ be the subclass of $\mathcal{A}$ consisting of univalent functions. For $0 \leq \alpha < 1$, let $\mathcal{S}^*(\alpha)$ and $\mathcal{K}(\alpha)$ be the subclasses of $\mathcal{S}$ consisting of starlike functions of order α and convex functions of order α, respectively, defined analytically by the conditions $\mathrm{Re}(zf'(z)/f(z)) > \alpha$ and $\mathrm{Re}(1 + zf''(z)/f'(z)) > \alpha$ respectively. These classes were introduced by Robertson [32]. In [14, 15], Janowski introduced general classes of starlike and convex functions using subordination. An analytic function f is subordinate to an analytic function g denoted by $f \prec g$, if there exists an analytic function $w : \mathbb{D} \to \mathbb{D}$ with $w(0) = 0$ satisfying $f(z) = g(w(z))$ for $z \in \mathbb{D}$. For $-1 \leq B < A \leq 1$, Janowski [14, 15] introduced the classes

$$\mathcal{S}^*[A, B] := \left\{ f \in \mathcal{A} : \frac{zf'(z)}{f(z)} \prec \frac{1 + Az}{1 + Bz} \right\}$$

and

$$\mathcal{K}[A, B] := \left\{ f \in \mathcal{A} : 1 + \frac{zf''(z)}{f'(z)} \prec \frac{1 + Az}{1 + Bz} \right\}.$$

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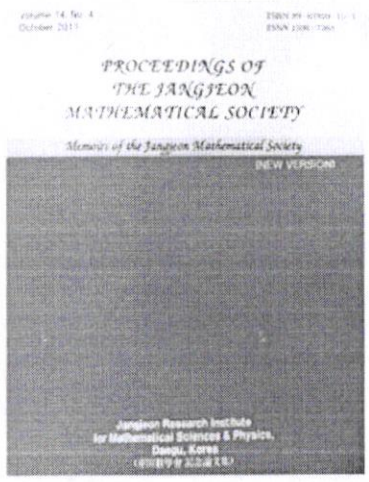

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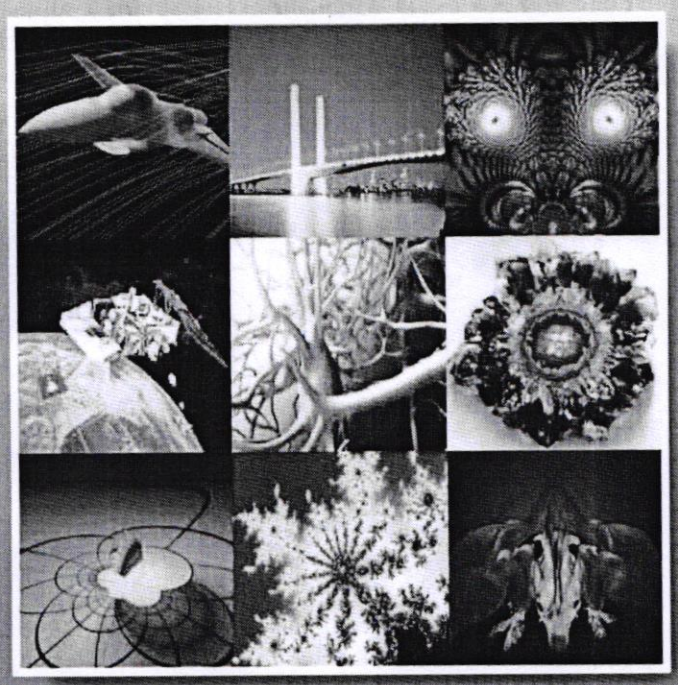

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