

SOME APPLICATIONS OF FRACTIONAL CALCULUS OPERATORS TO A CERTAIN SUBCLASSES OF UNIVALENT FUNCTIONS WITH NEGATIVE COEFFICIENTS

BY

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Abstract. The object of the present paper is to prove various distortion theorems for the fractional calculus and fractional integral operator of functions in the class $P^*(\alpha, \beta, \mu)$, consisting of analytic and univalent functions with negative coefficients.

1. Introduction

Let S denote the class of functions of the form

$$f(z) = z + \sum_{n=2}^{\infty} a_n z^n, \quad (a_n \geq 0), \quad (1.1)$$

which are analytic and univalent in the unit disc $U = \{z : |z| < 1\}$. Also let T be the subclass of S consists of functions in the form

$$f(z) = z - \sum_{n=2}^{\infty} a_n z^n, \quad (a_n \geq 0). \quad (1.2)$$

A function $f(z) \in T$ is said to be in the class $P^*(\alpha, \beta, \mu)$ if and only if

$$\left| \frac{f'(z) - 1}{\mu f'(z) + 1 - (1 + \mu)\alpha} \right| < \beta, \quad (z \in U), \quad (1.3)$$

for some $\alpha(0 \leq \alpha < 1)$, $\beta(0 < \beta \leq 1)$ and $\mu(0 \leq \mu \leq 1)$. The class $P^*(\alpha, \beta, \mu)$ was studied by Owa and Aouf [4]. In particular the class $P^*(\alpha, \beta, 1) = P^*(\alpha, \beta)$ was studied by Gupta and Jain [1].

Received October 8, 1994; revised September 15, 1997.
AMS Subject Classification. Primary 26A24; secondary 30C45.
Key words. analytic, univalent, fractional calculus.

Univalent Functions Fractional Calculus And Their Applications

Shigeyoshi Owa



Univalent Functions Fractional Calculus And Their Applications:

Univalent Functions, Fractional Calculus, and Their Applications H. M. Srivastava, Shigeyoshi Owa, 1989 Univalent Functions, Fractional Calculus, and Their Applications H. M. Srivastava, 1989 Univalent Functions, Fractional Calculus, and Their Applications H. M. Srivastava, Shigeyoshi Owa, 1989 **Exploring Mathematical Analysis, Approximation**

Theory, and Optimization Nicholas J. Daras, Michael Th. Rassias, Nikolaos B. Zographopoulos, 2024-01-04 This book compiles research and surveys devoted to the areas of mathematical analysis approximation theory and optimization Being dedicated to A M Legendre s work contributions to this volume are devoted to those branches of mathematics and its applications that have been influenced directly or indirectly by the mathematician Additional contributions provide a historical background as it relates to Legendre s work and its association to the foundation of Greece s higher education Topics covered in this book include the investigation of the Jensen Steffensen inequality Ostrowski and trapezoid type inequalities a Hilbert Type Inequality Hardy s inequality dynamic unilateral contact problems square free values of a category of integers a maximum principle for general nonlinear operators the application of Ergodic Theory to an alternating series expansion for real numbers bounds for similarity condition numbers of unbounded operators finite element methods with higher order polynomials generating functions for the Fubini type polynomials local asymptotics for orthonormal polynomials trends in geometric function theory quasi variational inclusions Kleene fixed point theorems ergodic states spontaneous symmetry breaking and quasi averages It is hoped that this book will be of interest to a wide spectrum of readers from several areas of pure and applied sciences and will be useful to undergraduate students graduate level students and researchers who want to be kept up to date on the results and theories in the subjects covered in this volume

Analysis and Topology Simion Stoilow, Themistocles M. Rassias, 1998 The goal of this book is to investigate further the interdisciplinary interaction between Mathematical Analysis and Topology It provides an attempt to study various approaches in the topological applications and influence to Function Theory Calculus of Variations Functional Analysis and Approximation Theory The volume is dedicated to the memory of S Stoilow **Current Topics in Analytic Function**

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Bainov,2020-05-18 No detailed description available for Proceedings of the seventh International Colloquium on Differential Equations Progress on Difference Equations and Discrete Dynamical Systems Steve Baigent,Martin Bohner,Saber Elaydi,2021-01-04 This book comprises selected papers of the 25th International Conference on Difference Equations and Applications ICDEA 2019 held at UCL London UK in June 2019 The volume details the latest research on difference equations and discrete dynamical systems and their application to areas such as biology economics and the social sciences Some chapters have a tutorial style and cover the history and more recent developments for a particular topic such as chaos bifurcation theory monotone dynamics and global stability Other chapters cover the latest personal research contributions of the author s in their particular area of expertise and range from the more technical articles on abstract systems to those that discuss the application of difference equations to real world problems The book is of interest to both Ph D students and researchers alike who wish to keep abreast of the latest developments in difference equations and discrete dynamical systems **Journal of Fractional Calculus** ,2002 *Basic Theory* Anatoly Kochubei,Yuri Luchko,2019-02-19 This multi volume handbook is the most up to date and comprehensive reference work in the field of fractional calculus and its numerous applications This first volume collects authoritative chapters covering the mathematical theory of fractional calculus including fractional order operators integral transforms and equations special functions calculus of variations and probabilistic and other aspects *Recent Advances in Fractional Calculus* R. N. Kalia,1993 Mathematical Methods in Medical and Biological Sciences Harendra Singh,Hari M Srivastava,2024-11-05 Mathematical Methods in Medical and Biological Sciences presents mathematical methods for computational models arising in the medical and biological sciences The book presents several real life medical and biological models such as infectious and non infectious diseases that can be modeled mathematically to accomplish profound research in virtual environments when the cost of laboratory expenses is relatively high It focuses on mathematical techniques that provide global solutions for models arising in medical and biological sciences by considering their long term benefits In addition the book provides leading edge developments and insights for a range of applications including epidemiological modeling of pandemic dynamics viral infection developments cancer developments blood oxygen dynamics HIV infection spread reaction diffusion models polio infection spread and chaos modeling with fractional order derivatives Presents the mathematical treatment of a wide range of real life medical and biological models including both infectious and non infectious diseases Provides in depth analysis of the spread of Covid 19 polio and HIV including discussion of computational methods and applications Includes computational modeling methods along with their practical applications providing the basis for further exploration and research in epidemiology and applied biomedical sciences **Fractals and Fractional Calculus in Continuum Mechanics** Alberto Carpinteri,Francesco Mainardi,1997-12-11 The book is characterized by the illustration of cases of fractal self similar and multi scale structures taken from the mechanics of solid and porous materials which have a technical interest In addition an accessible and self

consistent treatment of the mathematical technique of fractional calculus is provided avoiding useless complications

Study on applications for fractional calculus operators in univalent function theory Shigeyoshi Owa,2004

Mathematica Japonicae ,1998

Annales Polonici Mathematici ,2010

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