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UPPER AND LOWER ALMOST γ-CONTINUOUS MULTIFUNCTIONS

*N. GOWRISANKAR AND **N. RAJESH

Abstract. The aim of this paper is to introduce and study upper and lower γ-continuous multifunctions as a generalization of upper and lower γ-continuous multifunctions, respectively due to Monsef and Nasef. Some characterizations and several properties concerning upper(lower) almost γ-continuous multifunctions are obtained. The relationshipts between upper(lower) almost γ-continuous functions and upper(lower) γ-continuous multifunctions are also discussed.

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SOME CONDITIONS FOR UNIVALENCE OF A NONLINEAR INTEGRAL TRANSFORMS

C. SELVARAJ AND K. R. KARTHIKEYAN

Abstract. The purpose of this paper is to obtain the univalence of a certain nonlinear integral transform of f, for a function f in a subclass of the analytic functions.

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A GENERAL COMMON FIXED POINT THEOREM FOR OCCASIONALLY WEAKLY COMPATIBLE MAPS

H. BOUHADJERA

Abstract. The aim of this contribution is to establish and prove a general common fixed point theorem for four occasionally weakly compatible maps. Our result unifies and complements several various results, especially the main result of Djoudi [**?**].

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THE RADIUS OF UNIVALENCE OF A CERTAIN CLASS OF ANALYTIC FUNCTIONS DEFINED BY A GENERALIZED SĂLĂGEAN OPERATOR

ADRIANA CĂTAŞ

Abstract. Let $\mathcal{A}$ denote the class of normalized analytic functions $f(z)$ in the open unit disc $f(z) = z + \sum_{k=2}^{\infty} a_k z^k$. We consider in this paper a generalized Sălăgean operator which was introduced earlier by Al-Oboudi, namely $D_\lambda^m f(z) := z + \sum_{k=2}^{\infty} [1 + \lambda(k-1)]^m a_k z^k$ where $\lambda \in \mathbb{R}$, $\lambda \geq 0$, $m \in \mathbb{N} \cup \{0\}$. By means of this differential operator, a new class of univalent functions in the open unit disc is introduced. The main results of the present paper provide various interesting properties of functions belonging to the new class. Some of these properties include, for example, several coefficient inequalities and distortion bounds. Also the radii of close-to-convexity and starlikeness are determined. Relevant connections of some of the results obtained in this paper with those in earlier works are also provided.

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ON A SUBCLASS OF ANALYTIC FUNCTIONS WITH NEGATIVE COEFFICIENTS DEFINED BY GENERALIZED RUSCHEWEYH DIFFERENTIAL OPERATOR

SERAP BULUT

Abstract. In this paper, we introduce a new class of functions $Q_{\lambda}^{u}(\alpha, \beta, \gamma, \mu)$ which are analytic in the open unit disk $\mathbb{U}$ which is defined by generalized Ruscheweyh differential operator. For the functions belonging to this class, we obtain coefficient inequalities, Hadamard product, radii of close-to convexity, starlikeness and convexity, extreme points, the integral means inequalities for the fractional derivatives, and further we give distortion theorems using fractional calculus techniques.

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COEFFICIENT PROBLEMS FOR CERTAIN CLASSES OF p-VALENT FUNCTIONS INVOLVING HADAMARD PRODUCTS

B.A. FRASIN, B. SRUTHA KEERTHI, B. SRUTHA KEERTHI, AND B. ADOLF STEPHEN

Abstract. In this present investigation authors obtained the coefficient bounds $|a_{p+2} - \mu a_{p+1}^2|$ when $\mu \geq 1$ for various classes of p-valent starlike functions.

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A SUBCLASS OF ANALYTIC FUNCTIONS DEFINED BY A GENERALIZED SĂLĂGEAN OPERATOR

ALINA ALB LUPAŞ AND ADRIANA CĂTAŞ

Abstract. By means of a generalized Sălăgean differential operator we define a new class $\mathcal{BO}(p, m, \mu, \alpha, \lambda)$ involving functions $f \in A(p, n)$. Parallel results, for some related classes including the class of starlike and convex functions respectively, are also obtained.

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Key words and phrases. Analytic function, starlike function, convex function, Ruscheweyh derivative.

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STATIONARY THERMAL FLOW OF A BINGHAM FLUID WHOSE VISCOSITY, YIELD LIMIT AND FRICTION DEPEND ON THE TEMPERATURE

[1] F. MESSELMI, [2] B. MEROUANI

Abstract. We consider a mathematical model which describes the flow of a Bingham fluid whose the viscosity and yield limit depend on the temperature and with mixed boundary conditions, including a frictional boundary condition, modelled by a general velocity dependent dissipation functional and temperature. We derive a weak formulation of the coupled system of motion and energy equations which consists of a variational inequality for the velocity field. We prove, by using diverse techniques (compactness, monotonicity and fixed point) the existence of weak solutions as well as some results of continuous dependence. Finally, we describe a number of concrete friction conditions.

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Key words and phrases. Bingham fluid, frictional contact, subdifferential, thermal conductivity, variational inequality.

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CERTAIN CLASSES OF HARMONIC FUNCTIONS ASSOCIATED WITH DZIOK-SRIVASTAVA OPERATOR

G.MURUGUSUNDARAMOORTHY AND K.VIJAYA

Abstract. Making use of Dziok-Srivastava operator we introduced a new class of complex-valued harmonic functions which are orientation preserving , univalent and starlike in the unit disc. We investigate the coefficient bounds,distortion inequalities, extreme points and inclusion results for the generalized class of functions.

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Key words and phrases. Harmonic univalent starlike functions,Dziok-Srivastava operator, extreme points,convolution.

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CONTINUITY OF THE BLOW-UP TIME FOR A NONLOCAL DIFFUSION PROBLEM WITH NEUMANN BOUNDARY CONDITION AND A REACTION TERM

THÉODORE K. BONI AND HALIMA NACHID

Abstract. In this paper, we address the following initial value problem

$$\begin{aligned} &u_t = \int_\Omega J(x-y)(u(y,t)-u(x,t))dy + f(u) \quad \text{in} \quad \overline{\Omega}\times(0,T),\\ &u(x,0) = u_0(x) \geq 0 \quad \text{in} \quad \overline{\Omega}, \end{aligned}$$

where Ω is a bounded domain in $\mathbb{R}^N$ with smooth boundary $\partial\Omega$, $f : [0,\infty) \to [0,\infty)$ is a C^1 nondecreasing function, $\int^\infty \frac{d\sigma}{f(\sigma)} < \infty$, $J : \mathbb{R}^N \to \mathbb{R}$ is a kernel which is nonnegative and bounded in $\mathbb{R}^N$. Under some conditions, we show that the solution of a perturbed form of the above problem blows up in a finite time and estimate its blow-up time. We also prove the continuity of the blow-up time as a function of the initial datum. Finally, we give some numerical results to illustrate our analysis.

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CATEGORICAL SEQUENCES AND RELATIVE LUSTERNIK-SCHNIRELMANN CATEGORY

G. CICORTAŞ

Abstract. The aim of this paper is to define and to study categorical sequences for some generalizations of classical Lusternik-Schnirelmann category. We introduce the notion of relative categorical sequence and relative *categorical sequence respectively corresponding to the notions of relative LS-category defined by E. Fadell. The main results are the Fox's theorems for relative LS-category and relative LS-*category. Applications are product type inequalities.

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ON UPPER AND LOWER γ-θ-CONTINUOUS MULTIFUNCTIONS

N. GOWRISANKAR AND N. RAJESH

Abstract. In this paper, lower (upper) γ-θ-continuous multifunctions are introduced and characterized for the purpose of studying γ-closed spaces as introduced by Park [**?**].

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Key words and phrases. Topological spaces, γ-open sets, γ-closed sets, multifunctions.

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A NOTE ON PRESERVING PROPERTIES OF AN INTEGRAL OPERATOR

S. LATHA

Abstract. In this note, using Sălăgean operator some new subclasses of functions with negative coefficients are defined. Certain property preserving properties using an integral operator are discussed.

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Key words and phrases. Functions with negative coefficients, Integral operator and Sălăgean operator.

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CERTAIN SUBSETS IN IDEAL TOPOLOGICAL SPACES

ERDAL EKICI [1] AND TAKASHI NOIRI [2]

Abstract. In this paper, properties and the relationships of pre-I-open sets, δ-I-open sets and strongly β-I-open sets are investigated. The proof of Theorem 4.6 of [11] is improved.

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Key words and phrases. Ideal space, pre-I-open set, strongly β-I-open set, semi-I-open set, δ-I-open set, pre-I-clopen set, $\star$-dense set.

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QUASI-STATIC EVOLUTION OF DAMAGE IN THERMO-VISCOPLASTIC MATERIALS

[1] F. MESSELMI AND [2] B. MEROUANI

Abstract. We consider a mathematical model which describes the quasi-static evolution of damage in thermo-viscoplastic materials with displacement-traction and homogeneous Neumann boundary conditions. We derive a weak formulation of the system of equilibrium equation, energy equation and evolution damage inclusion which consists of a parabolic variational inequality for the damage field. We prove the existence and uniqueness of the solution, as well as, some properties of the solution.

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Key words and phrases. Damage field, temperature, thermo-viscoplastic, variational inequality.

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THE CONVERGENCE OF THE NEWTON'S METHOD FOR MULTIPLE ROOTS

RALUCA ANAMARIA SALAJAN

Abstract. In this article we study Newton's method for multiple roots, one of the most well known one-iteration method. For this method we give a theorem of global convergence. In the end of the paper we study a numerical example which illustrates the result exposed in this work.

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ANALYSIS OF A CONTACT PROBLEM WITH SLIP DEPENDENT COEFFICIENT OF FRICTION AND ADHESION FOR NONLINEAR ELASTIC MATERIALS

AREZKI TOUZALINE

Abstract. We consider a quasistatic frictional contact between a nonlinear elastic body and a foundation. The frictional contact is modelled with a simplified version of Coulomb's law of dry friction in which the coefficient of friction depends on the slip. The normal stress is prescribed on the contact surface in which adhesion is taken into account. The adhesion of contact surfaces is modelled with a surface variable, the bonding field, whose evolution is described by a first order differential equation. We provide the variational formulation of the mechanical problem and prove an existence and uniqueness result of the weak solution if either the slip weakening or the given normal stress on the contact surface are sufficiently small. The proofs are based on arguments of time-dependent variational inequalities, differential equations and Banach fixed-point theorem.

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ON SOME NEW DISCRETE INEQUALITIES

ZHAO CHANG-JIAN AND MIHÁLY BENCZE

Abstract. In this paper, we establish subtle-exploration forms of Yang Le inequality and some related improvements. Our results provide new estimates on inequalities of this type.

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Key words and phrases. Yang Le inequality, Jensen inequality, Kober inequality, Redheffer inequality.

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ANALYTICAL APPROXIMATE SOLUTIONS OF FRACTIONAL DIFFERENTIAL EQUATIONS BY LAPLACE ADOMIAN DECOMPOSITION METHOD

MOHAMMAD A. ZURIGAT

Abstract. This paper presents a numerical technique for solving fractional differential equations by employing the Laplace Adomian decomposition method (LADM). This method was applied in four examples to solve linear and nonlinear fractional differential equations which were presented as fractional initial value problems. The fractional derivatives are described in the Caputo sense. The results reveal that the method is effective and convenient for solving linear and nonlinear differential equations of fractional order.

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Key words and phrases. Laplace Adomian decomposition method, fractional differential equations, Caputo fractional derivative.

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ON CERTAIN MULTIVALENT HARMONIC MEROMORPHIC FUNCTIONS

ABDUL RAHMAN S. JUMA* AND S. R. KULKARNI**

Abstract. The aim of this paper is to introduce a subclass of multivalent harmonic meromorphic functions defined in the exterior of the unit disk. We obtain sufficient coefficient conditions and shown to be also necessary for this subclass by putting certain restrictions on the coefficients, distortion theorem, extreme points, convolutions properties and other results are also investigated.

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Key words and phrases. Multivalent functions, Meromorphic functions, Harmonic functions, Distortion theorem, Starlike functions.

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POINTWISE S-QUASI PROXIMALLY $\varphi\psi$-CONTINUITY BETWEEN TWO POINTWISE S-QUASI-PROXIMITY SPACES

BAYAZ DARABY

Abstract. In the present paper, by using of operations (is called here φ, ψ) we shall define pointwise S-quasi-proximally $\varphi\psi$-continuity and pointwise S-proximally $\varphi\psi$-continuity. We shall prove that the category of pointwise S-quasi-proximity spaces and pointwise S-quasi-proximally continuous morphisms is topological.

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SOME APPLICATIONS OF KIRICHENKO TENSORS

ABU-SALEEM AHMAD AND MIHAIL BANARU

Abstract. A short description of structural and virtual Kirichenko tensors that form a compete system of first-order differential-geometrical invariants of an arbitrary almost Hermitian structure is given. In two ways it is proved that an almost Hermitian structure is integrable if and only if its structural Kirichenko tensors vanish. A characterization of Gray-Hervella classes of almost Hermitian structures in terms of Kirichenko tensors is given.

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Key words and phrases. Almost Hermitian structure, Nijenhuis tensor, Kirichenko tensors, Gray-Hervella classification, integrable structure.

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CERTAIN DIFFERENTIAL SUPERORDINATIONS USING SĂLĂGEAN AND RUSCHEWEYH OPERATORS

ALINA ALB LUPAŞ

Abstract. In the present paper we define a new operator using the Sălăgean and Ruscheweyh operators. Denote by SR^n the Hadamard product of the Sălăgean operator S^n and the Ruscheweyh operator R^n, given by $SR^n : \mathcal{A} \to \mathcal{A}$, $SR^n f(z) = (S^n * R^n) f(z)$ and $\mathcal{A}_n = \{f \in \mathcal{H}(U),\ f(z) = z + a_{n+1}z^{n+1} + \ldots,\ z \in U\}$ is the class of normalized analytic functions with $\mathcal{A}_1 = \mathcal{A}$. We study some differential superordinations regarding the operator SR^n.

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CONVOLUTION POLYNOMIALS THROUGH BEATSON KERNELS IN THE UNIT DISK

SORIN G. GAL AND RICHARD GREINER

Abstract. In [**?**], the complete solution to the Schoenberg's problem in [**?**] is found, by giving the necessary and sufficient conditions satisfied by a smooth kernel such that the convolution defined through it be convexity preserving. The first aim of this note is to prove that the so-called Beatson kernels do not satisfy all these conditions due to the lack of an apparently minor property. Also, some shape preserving properties of the Beatson-type convolutions are presented.

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T-FUZZY IDEALS IN NEAR-SUBTRACTION SEMIGROUP

ALI H. HANDAM

Abstract. In this paper, we introduce the notion of T-fuzzy ideals in near subtraction semigroup with respect to a t-norm and then some related results are obtained. Using a t-norm T, the direct product of T-fuzzy ideals of near subtraction semigroups are discussed and some of their properties are investigated.

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