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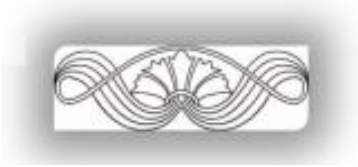

5TH INTERNATIONAL CONFERENCE ON MATHEMATICAL AND RELATED SCIENCES

BOOK OF ABSTRACTS

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Recent Developments In Elliptic Variational Problems With Nonstandard Growth Conditions

Maria Alessandra RAGUSA[1]

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ABSTRACT

In an open set $\Omega \subset \mathbb{R}^m$ $(m \geq 2)$ let us define the maps $u: \Omega \to \mathbb{R}^n$. Also, let us consider the $p(x)$-energy functional as follows

$$\mathcal{E}(u;\Omega) := \int_\Omega (g^{\alpha\beta}(x)G_{ij}(u)D_\alpha u^i(x)D_\beta u^j(x))^{p(x)/2}dx,$$

being $(g^{\alpha\beta}(x))$ and $(G_{ij}(u))$ symmetric positive definite matrices whose entries are continuous functions defined on Ω and $\mathbb{R}^n$ respectively, and $p(x)$ a continuous function on Ω with $p(x) \geq 2$.

Main focus is the study of regularity properties, interior and up to the boundary, of the minimizers u of $\mathcal{E}$ and developments in this direction (see e.g. [1,2,3]). Some open problems concerning qualitative properties are discussed.

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Some Basics and Recent Developments on Discrete Fractional Calculus

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ABSTRACT

Discrete fractional operators including fractional sums (discrete fractional integrals) and fractional differences (discrete fractional derivatives) are the discrete counterparts of fractional operators on the time scale $\mathbb{Z}$ or more generally on $\mathbb{Z}, h > 0$. In this talk, I try to review some of the recent developments on the theory and applications of discrete fractional operators with different kernels. Mainly, two classes of fractional difference operators will be outlined. The first type is based on the iteration of the (delta or nabla) summation to produce the fractional differences with power law kernels. The second part is based on the discretization of fractional operators with exponential and Mittag-Leffler kernels. Of special vitality, some possible discrete versions for the Mittag-Leffler functions will be presented.

Computation of Generalized Averaged Gaussian Quadrature Rules

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ABSTRACT

The estimation of the quadrature error of a Gauss quadrature rule when applied to the approximation of an integral determined by a real-valued integrand and a real-valued nonnegative measure with support on the real axis is an important problem in scientific computing. Laurie [2] developed anti-Gauss quadrature rules as an aid to estimate this error. Under suitable conditions the Gauss and associated anti-Gauss rules give upper and lower bounds for the value of the desired integral. It is then natural to use the average of Gauss and anti-Gauss rules as an improved approximation of the integral. Laurie also introduced these averaged rules. More recently, the author derived new averaged Gauss quadrature rules that have higher degree of exactness for the same number of nodes as the averaged rules proposed by Laurie. In [2], [5], [3] stable numerical procedures for computation of the corresponding averaged Gaussian rules are proposed. An analogous procedure can be applied also for a more general class of weighted averaged Gaussian rules introduced in [1]. Those results are presented in [4]. Here we we give a survey of the quoted results, which are obtained jointly with L. Reichel (Kent State Univ., OH (U.S.))

ACKNOWLEDGEMENT

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The Jensen and Hermite-Hadamard Inequalities

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ABSTRACT

We consider these two most important inequalities in more detail. A very general expansion of the initial integral form of the Jensen inequality is promoted for convex functions of several variables. A similar presentation is 4roject4 the classic form of the Hermite-Hadamard inequality. The presented versions can be further used to obtain generalizations of other important inequalities.

ACKNOWLEDGEMENT

This work has been fully supported by Mechanical Engineering Faculty, University of Slavonski Brod under the internal research 4roject Generalization of Arithmetic Means and Their Applications.

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Oscillatory Solutions For First Order Delay Differential Equations

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ABSTRACT

Consider the first-order retarded differential equation

$$x'(t)+p(t)x(\tau(t))=0,\ t\geq t_0$$

where $p(t)$ is function of nonnegative real numbers, $\tau(t)$ is a function of positive real numbers such that $\tau(t)<t$ for $t\geq t_0$, and $\lim_{t\to\infty}\tau(t)=\infty$. When the deviating argument is not necessarly monotone, a new oscillation criterion is established, involving limsup, that the well-known oscillation conditions are not satisfied in the li5iteratüreTwo examples illustrating the result are also given.

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On Generalizations of Some Integral Inequalities with the help of AB-Fractional Integral Operators and s-convex Functions

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ABSTRACT

One of the known methods in the 6peratör6e to obtain different versions, generalizations and extensions of inequalities is to use different classes of convex functions such that s-convexiy, m-convexity, harmonically convecity, r-convexity, quasi-convexity et al. Also, in recent years, fractional integral operators have become a frequently used method to obtain new versions, generalizations and extensions of classical integral inequalities. One of these operators is AB-fractional integral 6peratör defined by Atangana and Baleanu. In this study, we use the AB-fractional integral operators to establish some new generalized integral inequalities that are connected with the celebrated Hermite Hadamard integral inequality with the help of s-convex functions in the second sense.

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Midpoint Inequalities for Superquadratic Functions

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ABSTRACT

Superquadratic functions have been introduced as a modification of convex functions in [2]. A function $\varphi:[0,\infty)\rightarrow R$ is said to be superquadratic whenever for every $s\geq 0$ there exists a constant $C_{s}\in R$ such that

$$\varphi(t)\geq\varphi(s)+C_{s}(t-s)+\varphi(|t-s|), \quad \forall t\geq 0.$$

We say that φ is subquadratic if $-\varphi$ is a superquadratic function. Banic and Varosanec in [4] gave an important result with characterizations of the superquadratic functions, which are analogous to the well known characterizations of the convex functions.

The main object of this paper is to present the Hermite-Hadamard inequalities for superquadratics functions. We establish the midpoint inequalities with using a important integral identity for differentiable superquadratic mappings.

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Structural Properties and Fault Tolerance Assessment of a Cubic Graph Family: Generalized Pappus Graphs

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ABSTRACT

In an interconnection network, one of the most significant aims is the continuation of the data flow. Several studies have been conducted on the reliability and fault tolerance of underlying topologies of networks, as the results might affect the design and maintenance of the chosen network model. There are several parameters that have been defined to evaluate the fault tolerance of graphs [1,2,3]. In this study, we investigate some structural properties and the fault tolerance of a recently defined cubic graph family [4], namely the generalized Pappus graphs. Considering that the cubic graphs are good candidates for network models, the results are of critical importance in the design process of networks.

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New Approaches for Differentiable s-Convex Functions in The Fourth Sense via Fractional Integral Operators

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ABSTRACT

In this paper, we have given some well-known definitions, inequalities and new concepts for fractional calculus. Then, we have proved some new integral inequalities for differentiable s-convex functions via Atangana-Baleanu fractional integral operators. Also, we have given several special cases for our main findings.

Explicit Formula for Functions in The Selberg Class and Its Applications

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ABSTRACT

In this paper, we give explicit formula for even functions in the certain subclass of the extended Selberg class and assuming generalized Riemann hypothesis *GRH*, we give upper bounds 10ort he multiplicity of eventual zero at central point and 10ort he height of the first zero with imaginary part different from zero.

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Internality of Averaged Quadratures for Rational Modifications of Jacobi Measures

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ABSTRACT

We first investigate recurrence coefficients for orthogonal polynomials with respect to modifications of the Jacobi measures by rational functions. Although not computable in closed form, these coefficients are shown to admit asymptotic expansions in power series whose terms can be explicitly found. The obtained expansions are then used to check internality of nodes of generalized averaged quadratures.

ACKNOWLEDGEMENT
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The Error Bounds of Gaussian Quadratures for Some Rational Modification of Chebyshev Measures

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ABSTRACT

For an analytic integrand, the error term in the Gaussian quadrature can be represented as a contour integral. Thus finding its upper bound can be reduced to finding the maximum of the kernel on the contour. The contour is commonly taken to be an ellipse. The location of this maximum on the ellipse was investigated in special cases in a number of earlier papers, both for Gaussian and other Gaussian-type quadratures. In particular, this was done 12cur12he Chebyshev measures modified with a quadratic divisor (known as the Bernstein-Szegő measures). Here we examine the kernel 12cur12he Chebyshev measures modified by a linear rational function in the case of Gaussian quadratures and describe sufficient conditions 12cur12he maximum to 12cur on one of the semi-axes. Hence, we derive error bounds for these quadrature formulas. The results are illustrated by numerical examples.

ACKNOWLEDGEMENT

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Error Bounds of Gaussian Quadrature Formulae with Legendre Weight Function for Analytic Integrands

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ABSTRACT

In this paper we are concerned with a method 13ort hi numerical evaluation of the error term in Gaussian quadrature formula with the Legendre weight function. Inspired by the work of H. Wang & L. Zhang [J. Sci. Comput., 75 (2018), pp. 457—477] and applying the results of { S. Notaris [Math. Comp., 75 (2006), pp. 1217—1231] we have determined explicit formula 13ort hi kernel. This explicit expression is used for determining location on the ellipses where maximum of the modulus of the kernel is attained. Effective error bounds 13ort his quadrature formula for analytic integrands are derived.

ACKNOWLEDGEMENT

The research was supported in part by the Serbian Ministry of Education, Science and Technological Development, according to Contract 451-03-9/2021-14/200105 dated on February 5, 2021.

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Midpoint Type Inequalities Based on Conformable Fractional Integrals for *s*-Convex Mappings

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ABSTRACT

In the current research, some midpoint-type inequalities are established via *s*-convex mappings with the help of conformable fractional integrals. Some studies in the literature have been generalized using the well-known Hölder and Power-Mean inequalities and *s*-convex mappings. Some results including Riemann-Liouville integrals and Riemann integrals established based on *s*-convex mappings by special choices of variables within functions are obtained.

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Conformable Fractional Trapezoid Type Inequalities via *s*-Convex Functions

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ABSTRACT

In this article, some trapezoid-type inequalities are obtained for *s*-convex functions by means of conformable fractional integrals. These inequalities obtained are generalizations of inequalities for Riemann-Liouville fractional integrals and Riemann integrals.

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On New Versions of Bullen-Type Inequalities Based on Conformable Fractional Integrals

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ABSTRACT

This research is on the new versions of Bullen-type inequalities. These inequalities established by means of convex mappings include Conformable fractional integral operators. Obtaining these inequalities, well-known Hölder inequality and power mean inequality are also utilized. The resulting Bullen-type inequalities are a generalization of some of the studies on this subject, including Riemann integrals and Riemann-Liouville integrals. What's more, new results are obtained through special choices.

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Refinements of Hermite-Hadamard Inequalities for Conformable Fractional Integrals

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ABSTRACT

In the current paper, two new improvements for Hermite-Hadamard type inequalities are acquired with the help of the Conformable fractional integrals for convex functions. In achieving these improvements, two different defined functions are defined. More precisely, the convexity and increasing of the function are used. These improvements generalize some of the research in the literature.

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On Weighted Fractional Calculus with Sonine Kernels

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ABSTRACT

In this paper, we discuss the weighted fractional operators with the Sonine kernels and study related fractional differential equations. We define the weighted fractional integral 18ort he18 and present its properties. We then define the weighted fractional derivatives with the Riemann-Liouville and Caputo types. We establish two fundamental theorems of fractional calculus 18ort he presented operators. We also present, in closed forms, the solutions of related fractional differential equations via the Laplace transform. The presented operators include many fractional operators as particular cases, and they are generalization to the general fractional operators which were discussed recently by several authors.

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Norm and Numerical Radius Inequalities for Operator Matrices

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ABSTRACT

Operator matrices have played a significant role in studying Hilbert space operators. In this paper, we discuss further properties of 19peratör matrices and present new estimates 19peratö 19peratör norms and numerical radii of such operators. Moreover, 19peratör matrices whose real and imaginary parts are positive will be discussed, and sharper bounds will be shown for such class.

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Monotonicity Analysis of Discrete Liouville-Caputo Operators Defined Using Exponential Kernels

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ABSTRACT

We consider the analysis of discrete Liouville-Caputo-Fabrizio operators of fractional order. In the consequence the monotone increase and decrease of the function will be deduced. A direct relationship then will be able to give us these monotonicity results for discrete Riemann-Liouville-Fabrizio operators. Furthermore, we will analyse the sequential discrete Caputo-Fabrizio sum and Liouville-Caputo-Fabrizio difference of the same order. This enables us to state and prove the mean value theorem in discrete form of the Liouville-Caputo-Fabrizio difference operators.

ACKNOWLEDGEMENT

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New Algebraic Insights to the Goldbach Conjecture

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ABSTRACT

In this paper, we prove that every even integer n greater than 2 can be expressed as the sum of two numbers one of them is prime and the other is relatively prime to n. Moreover, we reformulated the Goldbach conjecture utilizing the properties of elements in the multiplicative group of integers modulo n.

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Conformable Triple Sumudu Transform with Applications

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ABSTRACT

In this article, a new approach, the triple Sumudu transform with some properties and applications are presented. We introduce the basic properties of the new approach. In order to illustrate the validity, efficiency, and applicability of the proposed transform, we apply the conformable triple Sumudu transform to solve some applications.

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This work was supported by the Deanship of Research in Zarqa University.

The Influence of c-Subnormality of Subgroups on The Structure of Finite Groups

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ABSTRACT

Let H be a subgroup of a group G. We say that H is c-ssubnormal in G if there exists a subnormal subgroup T of G such that HT = G and $H \cap T \leq H_G$, where H_G is the maximal normal subgroup of G which is contained in H . In this paper we shall investigate the influence of c-subnormality of some subgroups on the structure of finite groups further, and obtain some results on some kinds of weaker conditions.

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A Condition for the Supersolvability of Finite Groups

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ABSTRACT

A subgroup H of group G is called S-quasinormal in G if it permutes with every Sylow subgroup of G. In this thesis, we investigate the influence of S-quasinormal subgroups on the structure of finite groups and obtain some interesting results.

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Second Order Iterative Dynamic Boundary Value Problems Involving Mixed Derivative Operators and Demonstrated by Physical Applications

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ABSTRACT

In this paper, we derive sufficient conditions for the existence and uniqueness of solutions of the iterative dynamic boundary value problem of second order with mixed derivative operators. For the existence, we utilize Schauder's fixed point theorem while for uniqueness we apply contraction mapping principle. Further, a continuous dependence of bounded solutions to the addressed problem is studied. Finally, we demonstrate the validity of our findings by constructing examples as applications to beam deflection due to thermal stress and temperature distribution along the wire.

An Investigation into New Inequalities for Modified h −Convex Functions

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ABSTRACT

The main objective of this article is to obtain some new generalizations related to Hermite-Hadamard integral inequalities using modified h-convex functions. To prove these inequalities, we used the Hölder, Hölder-İşcan, Power-Mean and Improved Power-Mean integral inequalities. Finally, some applications for special means were also given.

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Some New Inequalities for Exponentially P- Functions on The Coordinates

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ABSTRACT

In this note, we defined a new class that is called exponentially P-functions which has a potential to produce novel estimations of Hadamard-type on the co-ordinates. Then, we have established some new Hermite-Hadamard type integral inequalities via exponentially P-functions on the coordinates.

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This study was supported by Ağrı İbrahim Çeçen University BAP Coordination Unit with the Project number FEF.22.004.

On Simpson's Type Inequalities for Quasi-Convex Functions via Atangana-Baleanu Integral Operators

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ABSTRACT

In the present note, several novel estimations of Simpson's type have been presented by using an integral identity that includes Atangana-Baleanu fractional integral operators for quasi-convex functions. We have used the basic definitions, some classical inequalities and elementary analysis methods.

Steffensen Type Generalizations for Convex Functions

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ABSTRACT

In this study we present new steffensen's type inequalities for the fonctions whose n-th order derivatives in absolute values are convex. Also ve give a remark for a special selection of one result.

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Hermite-Hadamard Type Inequalities via Atangana-Baleanu Fractional Integral Operators for Twice Differentiable Convex and (s,m)-Godunova-Levin Functions

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ABSTRACT

Recently, many fractional integral operators were introduced by different mathematicians. One of these fractional operators, Atangana-Baleanu fractional integral operator, was defined by Atangana and Baleanu (Atangana and Baleanu, 2016). In this paper, firstly, a new identity by using Atangana-Baleanu fractional integral operators is proved. Then, new fractional integral inequalities have been obtained for twice differentiable convex and (s,m)-Godunova-Levin functions with the help of this identity and some special cases have been considered.

A New Generalization of Convexity and Some New Integral Inequalities via Generalized Fractional Integral Operators

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ABSTRACT

In this paper, we have defined a new class of convex functions that will be called generalized $\boldsymbol{\sigma}-(s,m)$−convex functions. We have given some properties and special cases of this class of functions. Then, we have proved some novel integral inequalities by using generalized Riemann-Liouville fractional integral operators.

New Fractional Integral Inequalıtıes for Different Types of Convex Functions

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ABSTRACT

In this paper we obtained some new fractional inequalities for different kinds of convex functions using the proportional Caputo-hybrid operator with fairly elementary analysis. Since the proportional Caputo-hybrid operator is important in that its special cases gives a linear combination of Riemann-Liouville integral and a Caputo derivative, it was deemed appropriate to be used in this study.

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Some Fractional Integral Inequalities Obtained with the Help of Proportional Caputo Hybrid Operator

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ABSTRACT

In this paper we established some new inequalities using the proportional Caputo-hybrid operator with fairly elementary analysis. We also put forward some special cases of our results which match up with the literature.

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This work was supported by BAP (The Scientific Research Projects Coordination Unit) of Ağrı İbrahim Çeçen University.

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Some Reduction Algorithm Analyses for C_6 Groups

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ABSTRACT

An algorithm is said to be reduction if it builds up a homomorphism with nontrivial image and computes the image of all elements in the domain. Various reduction algorithms are available for Aschbacher's classical group classes but the analysis of the algorithm designed for C_6 groups has not yet been completed. We will discuss some of the analysis of this reduction algorithm for related groups.

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Some New Local Fractional Integral Inequalities of Maclaurin Type Obtain with the Help of s-Convex Functions

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ABSTRACT

In this paper, some new local fractional integral inequalities of Maclaurin type for functions whose local fractional derivatives are generalized s-convex functions are obtained by using a local fractional integral identity involving three point by the use of Peano kernel approach. It has been observed that some special cases of our findings coincide with the results in the literature.

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This work was supported by BAP (The Scientific Research Projects Coordination Unit) of Ağrı İbrahim Çeçen University.

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New Extensions of q_a-Hermite-Hadamard Inequality and q^b-Hermite-Hadamard Inequality

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ABSTRACT

In this study, we first introduce two mappings depending quantum intrgrals. Then we show that these functions are convex and monotonically increasing. We also prove some refinements of the left-hand sides of the q_a-Hermite-Hadamard inequality and q^b-Hermite-Hadamard inequality.

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The Solution of the Extended 16th Hilbert Problem for A Class of Discontinuous Piecewise Differential Systems Separated by A Straight Line

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ABSTRACT

One of the main problems in the qualitative theory of the planar differential systems is to control the existence and the number of their limit cycles. There are many researchers who tried to solve this problem for special classes of planar differential systems.
In this paper, we study the maximum number of limit cycles for discontinuous planar piecewise differential systems cycles formed by a linear center and a class of Hamiltonian isochronous global centers with a polynomial first integral of degree 2n is 5.

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Oscillatory Behavior of A Type of Caputo Fractional Differential Equations with Forcing and Damping Terms

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ABSTRACT

In this paper, we obtained the oscillatory behavior of solution for fractional differential equations with forcing and damping terms. We established sufficient conditions for the oscillation of all solutions of the proposed Caputo fractional equations and we constructed an illustrative example to demonstrate the effectiveness of our main theorem.

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A New Method for Finding Efficient Set of Multi-Objective Stochastic Linear Integer Program

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ABSTRACT

We propose a new method for finding all efficient solutions to a discrete stochastic multi-objective optimization problem for a two-stage model with fixed recourses, which is achieved by employing a series of cuts. Our algorithm converges in a finite number of iterations. The reported computational results show that our method can solve large-scale randomly generated instances and demonstrate the potential of our method.

Some Combinatorial Interpretations Refer to The Partial Bell Polynomials

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ABSTRACT

The partial Bell exponential polynomials have been narrowed down to certain special combinatorial sequences when variables are selected appropriately. Many researchers had already looked into these figures, as evidenced by numerous articles published in the literature.
In this work, we describe the 2-successive partial Bell polynomials, a novel family of special polynomials. Using the combinatorial approach, we prove the properties of these numbers, derive several identities, and discuss some special cases. This family includes well-known numbers and polynomials such as Stirling numbers, Bell numbers and polynomials, and so on. We investigate their properties by employing generating functions.

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Bound State Solution of the Klein–Fock–Gordon Equation for the Linear Combination of the Hulthén and the Type of Yukawa Potentials

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ABSTRACT

In this study, the bound state's solution of the modified Klein–Fock–Gordon equation is found for the new supposed combined Hulthén potential and the Yukawa types potentials. The analytical expressions of the energy eigenvalue and the corresponding radial wave functions are obtained for any orbital quantum number. The obtained eigenfunctions are expressed in terms of hypergeometric functions. We applied the developed approximation scheme to overcome the potential's centrifugal part difficulties. It is shown that energy levels and eigenfunctions are sensitive depending on potential parameters. Finally, we also investigate the energy eigenvalue and the corresponding radial wave function under some special cases.

Consequently, studying of analytical solution of the modified KFG equation is obtained for the Hulthén potential and the Yukawa types potentials potential within the framework conventional quantum mechanics could provide valuable information on the QM dynamics at nuclear, atomic and molecule physics and opens new window.

We can conclude that our analytical results of this study are expected to enable new possibilities for pure theoretical and experimental physicist, because the results are exact and more general.

Behavior of The Combination of CD and BA Methods for Unconstrained Optimization

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ABSTRACT

Conjugate gradient (CG) method is one of the most important iterative mathematical techniques used to solve unconstrained optimization problems because of its simplicity, low memory requirements and global convergence properties. In this study, we consider a new hybrid conjugate gradient method, which it is generated from a convex combination of Conjugate Descent proposed by Fletcher (abbreviated CD) and Al-Bayati and Al-Assady (abbreviated BA) methods, our selected method produces the sufficient descent at each iteration and global convergence property is established. Numerical results and their performances are presented to show that our new hybrid conjugate gradient method usually gives more efficient results than some of the known methods CD and BA.

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Limit Cycles Generated by Piecewise Linear Hamiltonian Systems Without Equilibria with Three Pieces

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ABSTRACT

The importance of studying piecewise linear differential systems has grown in recent years, due to their applications. Like we can see the appearance of this kind of system in modeling many natural phenomena, as in physics, biology, economics, etc. It is well known, that the limit cycles play a main role in the study of qualitative theory of piecewise differential systems. In most of the published papers that studied the limit cycles of piecewise differential systems formed by linear systems consider only two pieces. In this paper we investigate the maximum number of limit cycles for a family of piecewise linear differential systems formed by linear Hamiltonian differential systems without equilibria, where the separation curve splits the plane into three pieces and that made a big difference. First we prove that the systems that intersected the separation curve in three points exhibit 1, 2 or 3 limit cycles. Second we prove that the systems that intersected the separation curve in four points exhibit 1 limit cycle.

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Approximation in Linear Differential Equation

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ABSTRACT

In this study, we seek the approximation solution of linear differential equations through a truncate hat function basis using the Galerkin method. However, the approximation solution is sought in a finite-dimensional space, also the Galerkin equation or the variation form for the equation is solved by reducing it to an equivalent limit linear system. Moreover, the solution gives the hat coefficients and after that the approximation solution. The convergence and the error analysis of this method are discussed. At the end of this paper, some numerical examples are illustrated to show the efficiency of the proposed.

Reduction to an Integral Equation of The Boundary Value Problem for a Half-Ordered Integro-Differential Equation

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ABSTRACT

It is considered the following boundary value problem:

$$bD_2^{\frac{1}{2}}u(x) + cu(x) + \int_D k(x,\xi)u(\xi)d\xi = f(x), \quad x = (x_1, x_2) \qquad (1)$$

$$\alpha_1(x_1)u\big(x_1,\gamma_1(x_1)\big) + \alpha_2(x_1)u\big(x_1,\gamma_2(x_1)\big) = \varphi(x_1), \quad x_1 \in [a_1, b_1] \qquad (2)$$

where $b \in R$, $c \in R$, $b \neq 0$, $k(x,\xi)$ and $f(x)$ are continuous functions, $D_2^{\frac{1}{2}} = \frac{\partial^{\frac{1}{2}}}{\partial x_2^{\frac{1}{2}}}$, D-convex, bounded plane domain in the direction x_2, the boundary of the domain D is $\Gamma = \partial D$, which is Lyapunov line. $\alpha_k(x_1), \gamma_k(x_1), k = 1,2$ and $\varphi(x_1)$ are given continuous functions, $x_2 = \gamma_k(x_1)$ are equations for a divisible parts of the boundary line Γ (When projecting the domain D on the x_1 axis parallel to x_2) $\gamma_k(a_1) = \gamma_k(b_1) = x_{20} > 0$, $k = 1,2$.

If we integrate the equation (1) with respect to the second argument from the half- order and take into account the condition (2), then we obtain:

$$u(x) = \int_{x_{20}}^{x_2} k_0(x_2,\tau)u(x_1,\tau)d\tau + \int_{x_{20}}^{\gamma_1(x_1)} k_1(x_1,\tau,x_2)u(x_1,\tau)d\tau$$

$$+ \int_{x_{20}}^{\gamma_2(x_1)} k_2(x_1,\tau,x_2)u\big(x_1,\tau\big)d\tau + \int_D k_3(x_1,x_2,\xi)u(\xi)d\xi + F(x),$$

where $k_0(x_2,\tau), k_1(x_1,\tau,x_2), k_2(x_1,\tau,x_2), k_3(x_1,\tau,\xi)$ və $F(x)$ are kernels constructed by the data of problem (1)-(2) and expression has obtained within the following condition:

$$\alpha_1(x_1)\gamma_1^{-\frac{1}{2}} + \alpha_2(x_1)\gamma_2^{-\frac{1}{2}}(x_1) \neq 0.$$

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Analysis of a TB Mathematical Model via Fractional Operator

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ABSTRACT

The public health is at risk due to the bacillus Mycobacterium tuberculosis infection that causes tuberculosis (TB). TB-infected individuals typically spread the disease through the air when they speak, sneeze, cough, or spit. This illness affects the human body's lungs the most frequently, but it can also spread to other organs like the brain, spine, kidneys, and central nervous system [1]. In this context, the analysis of the TB mathematical model will be made through fractional derivative operators. First, the solution of the existence of the model to be extended to the fractional derivative operator will be examined. Then, the uniqueness of the solution of the mathematical model will be investigated. Finally, the model will be simulated with numerical calculations.

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Investigation of the Effects of Social Studies and Science Teachers' Social and Social Media Anxiety on Various Variables

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ABSTRACT

In this study, which aims to examine the effects of social media and Social Anxiety of Secondary School Social Studies teachers and Science teachers on various variables; it is investigated whether the communication of teachers, who experience anxiety in social environments, changes while using social media with their students according to their gender, branch, professional seniority, education level and duration of social media use. The method of the study is the quantitative research method. The study group of the study consists of Social Studies and Science teachers working in the province of Ağrı between 2020-2021. In the study conducted with 216 teachers, the seniority of more than half of the teachers is between 0-5 years. It has been determined that while 176 teachers have only undergraduate degrees, 37 teachers have completed their master's degree and 3 teachers holds their doctorate degree. Considering the use of social media by the teachers participating in the research, it is ascertained that the teachers have used social media for a maximum of 6-10 years. Social Media-Teacher-Student Interaction Scale developed by Korucu and Usta (2017) and Liebowitz Social Anxiety Scale developed by Dilbaz (2001) were used as data collection tools. The data obtained from the scales were analysed with the statistical program and presented. Some of the results obtained from the research are as follows: It has been concluded that the teachers' social media use and anxiety in social environments make no difference according to their gender, age, professional seniority, education degree and duration of social media use. In addition, according to the results of the Pearson correlation analysis, it was found out that there was no significant relationship between social media and social anxiety.

The Transformation of A Widely Used Lactation Model, Wood Model, into Biologically Meaningful Parameterized Model

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ABSTRACT

Graphs showing the change in milk yield over time are called lactation curves. Models have been developed to express the lactation curve mathematically. Instead of parameters such as a,b c used in these models, they have been transformed into biologically meaningful parameters such as t_{max} (time at the maximum yield), y_{max} (maximum yield), t_i (inflection point time), with the help of the first and second derivatives of the models. Since one of the most famous of these models is the Wood model, in this study the conversions to these biologically meaningful parameters were applied on this lactation model.

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Some Sum Formulas for Hyperbolic Pell and Hperbolic Pell-Lucas Numbers

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ABSTRACT

In the paper, let us define HP and HQ to be hypebolic Pell and Hyperbolic Pell-Lucas numbers. We have determined sum formulas for these hyperbolic number sequences.

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Dufort-Frankel Difference Method for Fractional order PseudoParabolic Differential Equation Defined by Atangana-Baleanu Caputo Derivative

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ABSTRACT

In this study, the Dufort-Frankel Difference Scheme method is used to achieve the numerical solution of the pseudo-parabolic partial differential equation. The difference scheme is constructed for the Pseudo-parabolic partial differential equation. The stability estimations for this difference scheme method is provided. By contrasting the exact and approximate solutions to this problem, the error analysis is calculated. The results obtained show that this method is efficient and suitable for the suggested problem, and other numerical methods can be used for the proposed problem.

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Some New Inequalities for Exponentially Quasi-Convex Functions on The Coordinates and Related Hadamard Type Integral Inequalities

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ABSTRACT

In this presentation, we recalled the notion of quasi-convex functions which have become a very popular topic in recent years and have been studied by many mathematicians. First, we have given the definiton of exponentially quasi-convex functions on the co-ordinates as a new concept. Then, we have proved some new Hermite-Hadamard type integral inequalities via exponentially quasi-convex functions on the coordinates.

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New Integral Inequalities Involving the Proportional Caputo-Hybrid Operators for s-Convex Functions

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ABSTRACT

In this paper, we establish some new Hermite-Hadamard-type inequalities for s-convex functions in the second sense via the proportional Caputo-hybrid operators. Hölder and Young's inequalities were used to prove the new results obtained. In addition, it is seen that the results obtained are reduced to the results obtained previously in the literature.

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The Method for Defining the Coefficient of Hydraulic Resistance on Different Parts of Lifting Pipe in Discrete Case

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ABSTRACT

In the paper the time-averaged mathematical model of gas lift process is considered. İn the first iteration the analytical expression is constructed by means of small parameter (the small parameter is taken as inverse value of the well) at the end of the lifting pipe and it is assumed that the coefficient of hydraulic resistance [1-4] has different values on different parts of lifting pipe. Using least squares method the quadratic functional is is constructed. The minimum of this functional with respect to the coefficient of hydraulic resistance gives us the desired result. On the basis of statistical data [5], asymptotical formulas for the coefficient of hydraulic resistance in each part of the lifting pipe are given.

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Finite Groups in Which Every Subgroup of The Sylow *p*-Subgroup Satisfies Certain Nearly *S*-Permutability Condition

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ABSTRACT

A group G is said to satisfy the Np-condition if every subgroup of a Sylow p-subgroup P of G is nearly S-permutable in the normalizer of P in G. The purpose of this paper is to investigate finite groups satisfying the Np-condition. In particular, we discuss the subgroup and quotient group closeness for the class of all finite Np-groups. Then, we conjecture a relation between the class of Np-groups and the class of finite groups in which nearly S-permutability is transitive.

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Analytical-Numerical Solutions for linear Systems of Second order Differential Equations by using Reprodusing Kernel Hilbert Space Method

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ABSTRACT

The Systems solutions of Second-order boundary value problems (BVPs) for ordinary differential equations are encountered very often in applied mathematics, physics and engineering such as atomic calculations, gas dynamics, and so on [1,2]. Recently, linear System second-order periodic BVPs, which consist of system second-order ordinary differential equations combined with periodic boundary conditions, have been vastly studied due to their broad range of application. [3,4] But those BVPs do not always have solutions which can be obtained using analytical methods, and must be approached with various approximate and numerical methods.The reproducing kernel has been effectively used as a base for constructing numerical solutions to applied sciences and various other important applications.

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Application of Fractional Gamma Three-Parameters Probability Distributioz

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ABSTRACT

In this paper, we will solve a fractional equation and find its properties and some applications**,** Such as **,** r^{th} moments, mean, variance, skewness, and kurtosis. In addition, it introduces conformable fractional analogs to some entropy measures, namely, Shannon, Renyi, and Tsallis entropy. All these concepts had been applied to the conformable fractional Gamma probability distribution.

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Fixed Point Results in Bicomplex Valued b-Metric Spaces

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ABSTRACT

In this paper, some fixed point results for self-mappings within rational expression inequalities in bicomplex valued metric spaces are introduced. Some relations and examples are discussed.
Also, fixed point theorems for self mappings in a bicomplex valued metric spaces are proved.

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A Proposed Mathematical Model for predicting Higher-education students' Satisfaction toward online Education during COVID-19 Pandemic in Developing Countries: An Empirical Investigation Using Mixed Method Research and Structured Equation Modelling

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ABSTRACT

The COVID-19 Pandemic has changed the educational and learning systems worldwide. It became an urgent imperative to "move online so that students could continue learning through the online mode. Despite the global trend of several higher education institutions transferring to online education modes as a response to the COVID-19 Pandemic and investing many resources to develop and deliver online courses, many students were forced to adapt to this sudden change. Students' satisfaction with online education has received limited academic studies, and the phenomenon has not been examined sufficiently in Arabic literature. Even this limited research that addressed online education satisfaction examined only one or a few students' satisfaction aspects, and some results are contradictory. Moreover, evidence from other relevant works indicated that students who depend on their instructors might not prefer online courses.

Thus, the current study aimed at helping to narrow the existing research gap and contribute to the accumulative knowledge by achieving the following objectives. (a) Provide a more in-depth understanding of the factors that may affect higher-education students' satisfaction with online education, specifically in developing countries (Egypt as an example). (b) Validate a research model for examining the most critical factors simultaneously. (c) Develop a mathematical model equation for predicting online education satisfaction to bridge the gap between theoretical background and practical applications.

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EHD Stability of an Oscillating Streaming Fluid Cylinder

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ABSTRACT

The electrogravitational instability of an oscillating streaming fluid cylinder surrounded by a self- gravitating tenuous medium pervaded by transverse varying electric field is discussed under the action of selfgravitating, capillary and electro dynamic forces. This has been done for all modes of perturbation. A second order integro-differential equation of Mathieu type has been drived. Several published works are obtained as limiting cases from the prestent general one. The model is stable due to the stabilizing effect of the transverse electric field in all modes of perturbation. The capillary force has a strong destabilizing influence on the selfgravitating instability of the model. The streaming has a strong destabilizing effect in all kinds of perturbation.

A Study of Numerical Solutions for A Family of Multi-Term Fractional-Order Integro-Differential Equations

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ABSTRACT

Throughout this paper, we make a generalization for the Laplace decomposition method to deal with one numerical solution for a family of multi-term fractional-order integro-differential equations and compare the efficiency of this method with the Homotopy perturbation method (HPM), since that (HPM) is one of the best and easiest ways to apply with best results. Different examples had discussed in this paper to show this method's performance. The two methods are characterized by the ease of obtaining approximate results of the equations. Finally, the results are presented and compared using tables and figures to show the reliability of the proposed methods.

ACKNOWLEDGEMENT
The Homotopy perturbation methods(HPM), Laplace decomposition method(LDM), of multi-term fractional-order integro-differential equation, and modified Laplace decomposition method.

Some Results for f-Minimal Hypersurfaces in Manifolds with Density

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ABSTRACT

In this work we study the hyperusrfaces of constant weighted mean curvature H_f embedded in weighted manifolds. We give a condition about these hypersurfaces to be minimal. These condition is given by the ellipticity of the weighted Newton transformations. We give in the end some examples and applications.

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Forecast COVID-19 Time Series Data of Jordan

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ABSTRACT

In this study, the autoregressive integrated moving average (ARIMA) method is applied to forecast daily new COVID-19 reported cases in Jordan. The appropriate ARIMA(p,d,q) model is applied to evaluate the forecasting value. Data for this study are collected from the Jordanian Ministry of Health. Performance measure indices (RMSE, MSE, MAPE) were used to present the accuracy of the forecasting result.
Further, the prediction of the Prophet model showed sufficient accuracy in the daily COVID-19 new cases of the Jordan. The ARIMA model is suitable for predicting Jordan, which can help take precautions and policy formulation for this epidemic in other countries.

Construction of Solutions for Fractional Shallow Water Equations By Sumudu Decomposition Method

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ABSTRACT

Sumudu decomposition method is developed to solve general form of fractional nonlinear Volterra-Fredholm integro-differential equation. The fractional derivative is described in the Caputo sense. The proposed method is based on the application of Sumudu transform to fractional nonlinear Volterra-Fredholm integro-differential equation. The nonlinear term can easily be handled with the help of Adomian polynomials. Illustrativeb examples are given, and the numerical results are provided to demonstrate the effciency of the proposed method.

Normal Holonomy Along Transnormal Curves in R4

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ABSTRACT

In this paper we study normal holonomy along transnormal curves in R4. The idea of normal holonomy will be exploited in the form of rotation to construct transnormal curves parallel to a 2-transnormal curve in R4.

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On Semi-Tangent Bundle

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ABSTRACT

We establish some new equalities involving product of two geometric objects in semi-tangent bundles. The aim of this study is to obtain new equations in the semi-tangent bundle and to examine the structures in the semi-tangent bundle. The tensor analysis used in the proofs is fairly elementary and based on the use of the Tangent and semi-tangent bundles geometry.

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Analytic Functions Defined by Ruscheweyh Derivative

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ABSTRACT

In this paper, we study the class $Q(m,\lambda,A,B)$ defined by Ruscheweyh derivative and obtain coefficient estimates, distortion theorem, closure theorems, integral operators, modified Hadamard product of functions and close-to-convexity, starlikeness and convexity for functions in this class.

Analytical Solution of the Schrödinger Equation for the Linear Combination of the Hulthén and the Yukawa Potential

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ABSTRACT

In this article, an analytical solution for bound states of the modified Schrödinger equation is found for the new supposed combined Hulthén plus the Yukawa potential. To overcome the difficulties arising in case of $l \neq 0$in the centrifugal part of the Hulthén plus the Yukawa potential for bound states, we applied the developed approximation. Analytical expressions for the energy eigenvalue and the corresponding radial wave functions for an arbitrary value $l \neq 0$ of the orbital quantum number are obtained. Also eigenfunctions expressed in terms of hypergeometric functions are obtained. It is shown that energy levels and eigenfunctions are very sensitive to the choice of potential parameters. Thus, the study of the analytical solution of the modified Schrödinger equation for the Hulthén potential plus the Yukawa potential in the framework of quantum mechanics can provide important information on the dynamics in nuclear, atomic, and molecular physics and makes it possible for a deeper study of this problem. We can conclude that the results obtained will be of interest not only to theoretical physicists, but also to experimental physicists due to precise and more general results.

Limit Cycle of the Discontinuous Piecewise System Formed by Nilpotent Saddles Separated by A Straight Line

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ABSTRACT

The solution of the second part of the sixteenth Hilbert's problem for discontinous piecewise differential systems have desrved the attention of many researchers. It is a question of finding the upper bound and the possible configuration of the limit cycles for a planar polynomial differential system of degree *n*. Here we are interested in solving the second part of the sixteenth Hilbert's problem for the discontinuous piecewise differential systems separated by straight line and formed by two arbitrary differential cubic Hamiltonian system with nilpotent Saddles.

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Analytical Solution of The Schrödinger Equation for The Linear Combination of The Eckart and The Yukawa Potential

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ABSTRACT

In this paper, the bound state solution of the modified Schrödinger equation is obtained for the linear combination of the Eckart and the Yukawa potential by using the developed scheme to overcome the centrifugal part. The energy eigenvalues and corresponding radial wave functions are defined for any value angular momentum case. Analytical expressions for the energy eigenvalue and the corresponding radial wave functions for an arbitrary value of the orbital quantum number are obtained by Nikiforov-Uvarov method. The energy levels and the corresponding normalized eigenfunctions are represented in terms of the Jacobi polynomials and also by hypergeometric functions for arbitrary orbital quantum states and find that the results obtained by them are consistent.

A closed form of the normalization constant of the wave functions is also found. It is shown that the energy eigenvalues and eigenfunctions are sensitive to radial and orbital quantum numbers.

Consequently, studying of analytical solution of the modified Schrödinger equation is obtained for the linear combination of the Eckart and the Yukawa potential could provide valuable information on the quantum mechanics Dynamics at nuclear, atomic and molecule physics and opens new window. We can conclude that our analytical results of this study are expected to enable new possibilities for pure theoretical and experimental physicist, because the results are exact and more general.