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1

Title: *Some Results on the Higher Multiplier of a Pair of Groups*
Vol.45(4) (2021) page: 429-435
Author(s): H. Arabyani
Abstract:

In this paper, we investigate the notion of the c-nilpotent multiplier of a pair of groups and present some exact sequences and isomorphisms for the c-nilpotent multiplier of a pair of groups. Also, we provide a sufficient condition for the c-nilpotent multiplier of a pair of groups to be finite. Moreover, we give some conditions under which the c-nilpotent multiplier of a pair of groups is not trivial.

Keywords: Pair of groups; Nilpotent group; Schur multiplier.

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Title: *Initial Coefficients of Certain Sub-classes of Bi-univalent Analytic Function on the Exterior of the Unit Disc*
Vol.45(4) (2021) page: 437-443
Author(s): S. Barik and A. Kumar Mishra
Abstract:

We develop a new method to find improved bounds on the modulii of the $zero^{th}$, first and second coefficients for the functions in certain sub-classes of bi-univalent functions in the exterior of the unit disc of the complex plane. Our bounds are obtained by refining well known estimates for the initial coefficients of the Carthéodory functions.

Keywords: Analytic function; Analytic continuation; Univalent functions; Bi-univalent functions; Coefficient bounds.

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Title: *Path Integrals for Scalar Fields: The Henstock Approach*
Vol.45(4) (2021) page: 445-459
Author(s): V. Boonpogkrong
Abstract:

In the classical physics, the quantum mechanics can be formulated in terms of path integrals. A path integral is an operator calculus, as pointed out by Feynman. The gauge approach to path integrals was first presented by Henstock in 1970's, see [5]. This approach was elaborated further in [8]. In this paper, we present a path integral for scalar fields $\phi(x,t)$, where $x,t \in [0,\infty)$, using the gauge approach called Henstock approach in this paper. The equivalent theorem between the integral defined by using Henstock approach and the classical definition is proved. The sequentially equivalent definitions are discussed.

Keywords: Henstock integral; Path integral; Feynman integral; Operator calculus; Field theory; Wiener measure.

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Title: *Adaptive Sampling Recovery and Nonlinear Approximations of Multivariate Functions in Besov-type Spaces*
Vol.45(4) (2021) page: 461-482
Author(s): N.M. Cuong
Abstract:

We investigate nonlinear approximations by sets of finite cardinality or of finite pseudo-dimesion and the optimality in terms of entropy numbers and other characterizations for nonlinear approximations. Functions to be approximated are in Besov type spaces of functions having a certain mixed smoothness. We prove the asymptotic order of these quantities and explicitly construct asymptotically optimal methods of nonlinear approximation based on a trigonometric sampling representation in Besov type spaces.

Keywords: Besov-type spaces; Sampling trigonometric representation; Nonlinear approximation; Adaptive sampling recovery; Entropy numbers; pseudo-dimension.

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Title: *A Polynomial Shared by an Entire Function and its Linear Differential Polynomials*
Vol.45(4) (2021) page: 483-495
Author(s): G.K. Ghosh
Abstract:

The uniqueness problems on entire functions sharing at least two values with their derivatives have been studied and many results on this topic have been obtained. In this paper, we study an entire function $f(z)$ that shares a polynomial $a(z)$ with $f^{(1)}(z)$, together with higher order derivatives of linear differential polynomials generated by them.

Keywords: Entire function; Polynomial; Linear differential polynomials.

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Title: *Inequalities for the Derivative of a Polynomial*
Vol.45(4) (2021) page: 497-508
Author(s): M.H. Gulzar, B.A. Zargar and R. Akhter
Abstract:

In this paper, we find a lower bound for the maximum moduli of the derivative and polar derivative of a polynomial in terms of the moduli of the coefficients and the maximum modulus and the minimum modulus of the polynomial. Our paper generalises and also refines many known results in the field.

Keywords: Polynomial; Polar derivative; Inequalities.

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Title: *On Golden Semi-Symmetric Non-Metric F-Connections*
Vol.45(4) (2021) page: 509-520
Author(s): C. Karaman and A. Gezer
Abstract:

The main purpose of the present paper is to construct golden semi-symmetric non-metric F-connections on a locally decomposable golden Riemannian manifold and investigate some properties of torsion and curvature tensors of these connections.

Keywords: Golden Riemannian structure; Dual connection; Semi-symmetric non-metric F-connection; Tachibana operator.

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Title: *On Cyclic Codes with Minimal Generating Sets over the Ring $\mathbb{Z}_{p^k}$*
Vol.45(4) (2021) page: 521-532

Author(s): O.M. Prakash, H. Islam and S. Das
Abstract:

For a prime p and an integer $k > 1$, $\mathbb{Z}_{p^k}$ denotes the ring of residue classes of integers modulo p^k. This article completely determines the structure of cyclic codes over $\mathbb{Z}_{p^k}$. Also, minimal generating sets for those codes are obtained. Finally, some computational examples are given in support of our results.

Keywords: Cyclic code; Hamming distance; Generator polynomial.

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Title: *Existence and Concentration of Ground State Solutions for the Coupled Nonlinear Schr*
Vol.45(4) (2021) page: 533-560
Author(s): W.B. Wang, Q.Q. Li, J.W. Zhou and Y.K. Li
Abstract:

This article concerns the coupled Schr\"{o}dinger system in whole space $\mathbb{R}^N$

$$

-\varepsilon^{2}\Delta u+V(x)u=P(x)|u|^{p-2}u+Q(x)|u|^{\frac{p}{2}-2}u|v|^{\frac{p}{2}},

$$

$$

-\varepsilon^{2}\Delta v+V(x)v=Q(x)|u|^{\frac{p}{2}}|v|^{\frac{p}{2}-2}v+P(x)|v|^{p-2}v,\\

$$

where $\varepsilon > 0$ is a small parameter. Under some suitable conditions, we obtain the existence of ground state for $\varepsilon > 0$ via the Nehari manifold and concentration-compactness principles. Furthermore, we prove these ground state solutions concentrate at some set related to V, P and Q.

Keywords: Coupled Schr\

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Title: *On Jointly Second (R,S)-Submodules*
Vol.45(4) (2021) page: 561-570
Author(s): D.A. Yuwaningsih and I.E. Wijayanti
Abstract:

Let R and S be commutative rings and M be an (R, S)-module. In this paper, we present the dual notion of jointly prime (R, S)-submodules, that is called jointly second (R, S)-submodules, and we investigate some properties of them. We give a necessary and sufficient condition for an (R, S)-submodule being jointly second (R, S)-submodules. Moreover, we present the definition of jointly second (R, S)-modules and present a condition for jointly prime (R, S)-modules being jointly second (R, S)-modules and vice versa.

Keywords: Second submodules; Coprime submodules; Jointly prime; Second modules.

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Title: *Call for Papers*
Vol.45(4) (2021) page:
Author(s):
Abstract:
Keywords:

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