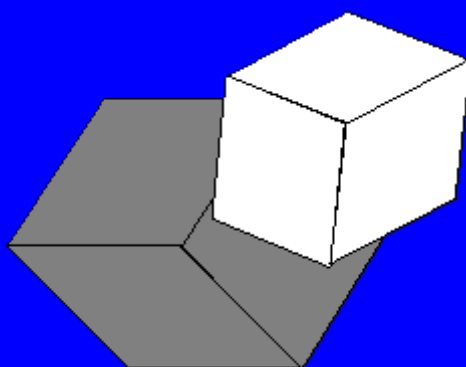


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Papers Abstracts



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Characterizing finite groups with mutually N -permutable products and smooth maximal subgroups

Mohamed. H. Abd-Ellatif

Let $G = HK$ be a finite group, where H and K are proper subgroups of G . A group G is called a mutually N -permutable product of H and K if H permutes with every normal subgroup of K , and K permutes with every normal subgroup of H . In this paper, as a next step of some recently studies, we examine the structural properties of finite group G that is a mutually N -permutable product of two subgroups, with the additional assumption that all maximal subgroups of G are generalized smooth groups. (pp. 1–14)

On the p -biharmonic maps, conformal deformation and the warped product

Smail Chemikh, Seddik Ouakkas

In this paper we present some constructions of the p -biharmonic maps by conformal deformation, we characterize a p -biharmonicity of the first projection and we give many examples of p -biharmonic maps. (pp. 15–35)

Operator products and algebraic spectral subspace preservers

Ismail El Khchin, Hassane Benbouziane, Mustapha Ech-Chérif El Kettani

Let $\mathcal{X}$ be an infinite-dimensional complex Banach space and $\mathcal{B}(\mathcal{X})$ be the algebra of all bounded linear operators on $\mathcal{X}$. For $T \in \mathcal{B}(\mathcal{X})$, and a fixed nonzero complex scalar λ_0 , we denote by $E_T(\{\lambda_0\})$, the algebraic spectral subspace of T associated with $\{\lambda_0\}$. In this paper, we characterize maps ϕ on $\mathcal{B}(\mathcal{X})$ for which whose ranges contain all operators of rank at most two (resp. at most four), and that satisfy $E_{TS}(\{\lambda_0\}) = E_{\phi(T)\phi(S)}(\{\lambda_0\})$ (resp. $E_{TST}(\{\lambda_0\}) = E_{\phi(T)\phi(S)\phi(T)}(\{\lambda_0\})$), for all $T, S \in \mathcal{B}(\mathcal{X})$. (pp. 36–49)

Understanding bipartite soft semigraph structures

Bobin George, Jinta Jose, Rajesh K. Thumbakara

Soft set theory functions as a flexible mathematical instrument designed to handle uncertain data by aiding in the categorization of universe elements according to predefined parameters. Unlike hypergraphs, semigraphs present a wider interpretation of conventional graphs, allowing for a finer representation of relationships. Through the integration of soft set principles, the notion of soft semigraphs arises, enhancing the adaptability and versatility of semigraphs in addressing uncertainty. This paper sets out to reveal different forms of bipartite soft semigraphs, meticulously examining their varied structures and delving into their inherent characteristics. (pp. 50–60)

On semi-Hamilton groups and minimal non-semi-Hamilton groups

Zhangjia Han, Dongyang He, Huaguo Shi

A subgroup H of a finite group G is said to be semipermutable in G if it is permutable with every subgroup K of G satisfying that $(|K|, |H|) = 1$. If every subgroup of G is semipermutable in G , then G is said to be a semi-Hamilton group. In this paper, the authors classify the non-semi-Hamilton groups whose proper subgroups are all semi-Hamilton groups. (pp. 61–72)

The influence of $IC\bar{s}$ -subgroups on the structure of finite groups

Huajie Zheng, Yong Xu, Songtao Guo

A subgroup H of a group G is said to be an $IC\bar{s}$ -subgroup of G if the intersection of H and $[H, G]$ is contained in $H_{\bar{s}G}$, where $H_{\bar{s}G}$ is the maximal s -semipermutable subgroup of G contained in H . Our main result here is the following. Let $\mathfrak{F}$ be a solubly saturated formation containing $\mathfrak{U}$ and E be a normal subgroup of a group G such that $G/E \in \mathfrak{F}$. Let $X = E$ or $X = F^*(E)$. If every non-trivial Sylow subgroup P of X has a subgroup D with $1 < |D| < |P|$ such that every subgroup of P with order $|D|$ and 4 (if $|D| = 2$ and P is a non-abelian 2-group) is an $IC\bar{s}$ -subgroup of G , then $G \in \mathfrak{F}$. (pp. 73–81)

Generalizations of unitarily invariant norm inequalities for matrices

Xingkai Hu, Yuan Yi, Jianming Xue

In this article, we begin by deriving a unitarily invariant norm inequality for matrices, which is a generalization of the result due to Cao and Wu. Additionally, we introduce a matrix Cauchy-Schwarz inequality for unitarily invariant norms, further generalizing the inequality proposed by Hu. (pp. 82–91)

An overview of hypercompositional algebra applications on graphs

Antonios Kalampakas

Graphs are fundamental structures in mathematics and computer science for modeling relationships between objects. This paper studies three hypercompositional structures that are derived from graphs, namely the Path hyperoperation, Simple Path hyperoperation, and Ancestry hyperoperation. These hyperoperations capture complex relationships, offering a robust framework for analyzing intricate connections within graphs. We investigate their properties and provide detailed examples to illustrate their applications. (pp. 92–103)

A note on hyperrings and hypermodules

Engin Kaynar, Burcu Nişancı Türkmen, Ergül Türkmen

The main purpose of this paper is to study the concept of the hyperring $(\mathbb{N}, \oplus, \cdot)$, where $m \oplus n = \{m + n, k \mid \min\{m, n\} + k = \max\{m, n\}\}$, for all $m, n \in \mathbb{N}$ and the operation $\cdot$ is the usual multiplication in $\mathbb{N}$. In particular, we prove that this hyperring $(\mathbb{N}, \oplus, \cdot)$ is isomorphic to Krasner's quotient hyperring $\frac{\mathbb{Z}}{G}$ in [10]. Moreover, we construct the hyperstructure $(\mathbb{N}_m, \oplus_m, \cdot)$, which is a class of examples of hypermodules and hyperrings. (pp. 104–116)

Semihyperlattice regular equivalence relations on ordered semihypergroups

Yize Li, Xinyang Feng, Xing Gao, Jingxiang Wu

In this paper, we explore the semihyperlattice regular equivalence relations on ordered semihypergroups. To begin with, we present the specific constructions of semihyperlattice regular equivalence relations. This effort is directed towards ensuring the preservation of the hyperalgebraic structure within the quotient hyperalgebra. Subsequently, we obtain a homomorphism theorem from ordered semihypergroups to ordered semihyperlattices. Finally, we discuss some related properties of congruence classes and principal pseudo-hyperfilters. (pp. 117–128)

Prime-valent one-regular graphs of order $28p$

De-Xue Li, Song-Tao Guo

A graph is *one-regular* if its full automorphism group acts on its arcs regularly. In this paper, we classify connected one-regular graphs of prime valency and order $28p$ for each prime p , and prove that there is only one sporadic graph: the $\mathbb{Z}_7$ -cover CQ_7 of the three dimensional hypercube Q_3 with valency 3. (pp. 129–137)

Hypervaluations on ternary semihyperrings

Sumana Pal, Jayasri Sircar, Pinki Mondal

This article aims to present the concept of hypervaluation on a commutative ternary semihyperring mapped onto an ordered abelian group. It examines various properties of hyperideals within the ternary semihyperring that correspond to the valuation map. Additionally, the article explores results which are similar to those found in classical valuation rings, but within the framework of hypervalued ternary semihyperrings. (pp. 138–150)

Non-existence of integer solutions for the Diophantine equation

$p^x + p^y + n^z = w^2$, where p is an odd prime number and n is a positive integer

Suton Tadee, Apirat Siraworakun

In this research, we investigate some conditions for the non-existence of integer solutions of the Diophantine equation $p^x + p^y + n^z = w^2$, where p is an odd prime number and n is a positive integer. Moreover, numerous examples to illustrate these cases are provided. (pp. 151–165)

Precedence hyperstructures and graphs in assembly line design

Anastasia Taouktsoglou, Stefanos Spartalis

In this paper we introduce the precedence hyperoperation, which constructs a precedence partial hypergroupoid, i.e. a partial hypergroupoid with some special properties. Given a precedence partial hypergroupoid, a precedence graph can be defined and vice versa. Using the precedence partial hypergroupoid of a precedence graph and the Fewer-Descendants-Vertex First algorithm (FDVF algorithm), a process flow diagram is created, which can be used in mixed-model assembly line design. (pp. 166–184)

On τ -supplemented Krasner hypermodules

Burcu Nişancı Türkmen, Bijan Davvaz

In this study we define the radical of the Krasner hypermodules in the subcategory ${}_{R_S}hmod$, then we use short exact sequences in homological algebra for Krasner hypermodules. Besides, by studying the concept of τ -supplements in module theory we will generalize it to the Krasner R -hypermodules by using short exact sequences and a subcategory of ${}_{R_S}hmod$. (pp. 185–199)

Exchange pre-Hilbert algebras and their connections with other algebras of logic

Andrzej Walendziak

In the paper, as a generalization of well-known Hilbert algebras, exchange pre-Hilbert algebras are introduced. Their properties and characterizations are investigated. Some important results and examples are given. Moreover, connections between exchange pre-Hilbert algebras, generalized exchange algebras and BE algebras are presented. Finally, implicative and positive implicative algebras are considered. It is shown that implicative (resp. positive implicative) exchange pre-Hilbert algebras are equivalent to implicative BE algebras with (*) (resp. generalized Hilbert algebras). (pp. 200–214)

The residuated lattice-orderability of idempotent monoids

Wei Chen

In this paper, we study a class of residuated lattices, namely, conical idempotent residuated lattices. We give necessary and sufficient conditions for an idempotent semigroup with an identity to be the semigroup reduct of some conical idempotent residuated lattice. (pp. 215–236)

Recurrent Hopf hypersurfaces in complex 2-plane Grassmannians

Wenjie Wang

In this paper, it is proved that if the shape operator of a Hopf hypersurface in complex two-plane Grassmannians $G_2(\mathbb{C}^{m+2})$ is Reeb recurrent, it is Reeb parallel. Another recurrent hypersurfaces are also classified. (pp. 237–247)

New characteristics and applications of the EP, normal and Hermitian matrices

Xiaoji Liu, Huijia Hao

In this paper, we present the EP-matrices, normal, and new features of the Hermitian matrix. We are going to push it to a higher order form. This paper describes EP-matrices, normal matrices and Hermitian matrix equivalent forms by using Core inverse. We also give several special equivalent facts by use decompositions. We also give other special equivalent facts. A new equivalent condition for the reverse order law is also obtained. (pp. 248–266)

More on the weakly S -2-prime ideals of commutative rings

Sanem Yavuz, Bayram Ali Ersoy, Ünsal Tekir, Ece Yetkin Çelikel

Prime ideals and their generalizations are fundamental in various research areas, especially in commutative algebra. The study of weakly prime ideals is marked the beginning of this generalization. Subsequent research has further expanded these concepts, with recent attention on weakly 2-prime and S -2-prime ideals. This study aims for new characterizations of weakly S -2-prime ideals, a generalization that includes both weakly 2-prime and S -2-prime ideals. To achieve this goal, we construct an ideal disjoint with a multiplicatively closed subset of commutative rings. We explore several characterizations concerning weakly S -2-prime ideals and investigate this class of ideals in polynomial and formal power series rings. Besides, we examine several new results regarding the trivial extension and amalgamated algebra along an ideal with respect to a ring homomorphism concerning weakly S -2-prime ideals.

(pp. 267–279)

[L-filters and TL-filters in IL-algebras](#)

Şerife Yılmaz, Huriye Betül Doğru, Hashem Bordbar

In this paper, we introduce the concepts of L -filter and TL -filter as two different generalizations of the notion of fuzzy filter in IL -algebras. We investigate some properties with respect to these concepts. We study the relationship between L -filters and TL -filters. We give some characterizations for filters of IL -algebras by using L -filters and TL -filters. We present additional conditions so that the notions of L -filter and TL -filter coincide in an IL -algebra. (pp. 280–293)

[On biharmonic surfaces in pseudo-Riemannian 4-dimensional space forms](#)

Yonggang Zhang, Li Du

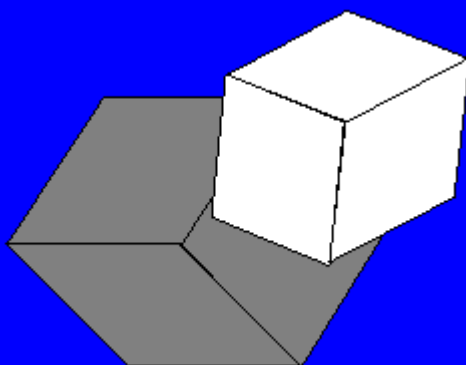
In this paper, biharmonic pseudo-Riemannian surfaces with diagonalizable shape operator in pseudo-Riemannian space form $N_s^4(c)$ are studied. We prove that the surfaces with light-like mean curvature vector field are pseudo-umbilical. For non light-like mean curvature vector field, we show that the pseudo-umbilical surfaces is minimal or $H^2 = |c|$. Also, we give some sufficient conditions for such surfaces with parallel mean curvature vector field to be minimal. (pp. 294–304)

[Groups in which every element centralizer is a TI-subgroup](#)

Xianhe Zhao, Yuxin Zhao, Ruifang Chen

Let G be a finite group. Recall that a subgroup H is called a TI -subgroup of G if $H \cap H^g = 1$ or H for every element g of G . We call a group G a CTI -group if its every element centralizer is a TI -group. Clearly S_3 , A_5 , D_7 and Q_8 are all CTI -groups. In this paper, we investigate the structure of a CTI -group G and prove that a CTI -group G is a nilpotent group or a Frobenius group whose complement is either cyclic or the direct product of a cyclic group of odd order and Q_8 , or $G \cong PSL(2, 2^n)$ with $n > 1$. (pp. 305–312)

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