

## Summaries of articles published in this issue

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## SUMMARIES OF ARTICLES PUBLISHED IN THIS ISSUE

(Publication of these summaries is permitted)

DALIBOR KLUCKÝ, Olomouc: *Ternary rings with zero associated to desarguesian and pappian planes*. Czech. Math. J. 24 (99), (1974), 607—613. (Original paper.)

In this paper, the necessary and sufficient conditions that a planar ternary ring with zero coordinatizes a desarguesian plane and a pappian plane are deduced.

VÁCLAV HAVEL, Brno: *A general coordinatization principle for projective planes with comparison of Hall and Hughes frames and with examples of generalized oval frames*. Czech. Math. J. 24 (99), (1974), 664—673. (Original paper.)

A general principle of coordinatization of projective planes is presented. The resulting coordinatizing algebraic systems include planar ternary rings. The Hall and Hughes frames are described in detail. As a further important special case the so called generalized oval frames are investigated. Finally some examples of “proper” generalized oval frames are given.

HARBANS LAL, Delhi: *Commutative semi-primary semigroups*. Czech. Math. J. 25 (100), (1975), 1—3. (Original paper.)

In this paper the author deals with semigroups in which every ideal is semi-primary where in a commutative semigroup, an ideal  $A$  is called a semi-primary ideal if  $\sqrt{A}$  is a prime ideal.

JOHN J. BUONI, Youngstown: *A trace inequality for functions of triangular Hilbert-Schmidt operators*. Czech. Math. J. 25 (100), (1975), 4—7. (Original paper.)

Let  $X$  and  $Y$  be simultaneously triangularizable Hilbert-Schmidt operators and  $f(\lambda)$  an analytic function vanishing at zero with a power series whose region of convergence contains  $\sigma(X)$  and  $\sigma(X + Y)$ . It is then shown that if, for  $r > 0$ ,  $|(f(\delta) - f(\alpha))/(\delta - \alpha)| < r$ , where  $\delta \in \sigma(X + Y)$  and  $\alpha \in \sigma(X)$ , then  $|\{\text{trace}(YY^*)\}^{-1} \text{trace}\{Y(f(X + Y) - f(X))\}| < r$ .

Н. В. ВЕЛИЧКО, Тюмень: *Заметка о перистых пространствах*. Czech. Math. J. 25 (100), (1975), 8—19. (Оригинальная статья.)

В предыдущей заметке автора изучено поведение слабо паракомпактных  $p$ -пространств при замкнутых и совершенных отображениях. В этой статье продолжается изучение свойств перистых пространств, основное внимание уделяется строго перистым пространствам и проблеме уплотнений.

LADISLAV MIŠÍK, Bratislava: *Über approximative derivierte Zahlen*. Czech. Math. J. 25 (100), (1975), 154—162. (Originalartikel.)

Ein analoger Satz, wie der bekannte Satz von A. Khintchine über die approximative Ableitung von monotonen Funktionen, ist für die Menge aller approximativen derivierten Zahlen von Lipschitzfunktionen bewiesen.

BEDŘICH PONDĚLÍČEK, Poděbrady: *On weakly commutative semigroups*. Czech. Math. J. 25 (100), (1975), 20–23. (Original paper.)

In his former paper, N. P. Mukherjee studies some properties of quasi-commutative semigroups. In this note the author extends his results on quasi-commutative semigroups to weakly commutative or duo semigroups. Finally, the author considers the maximal separative homomorphic image of a duo semigroup.

GARY HAGGARD, Orono and PETER MCWHA, Waterloo: *Decomposition of complete graphs into trees*. Czech. Math. J. 25 (100), (1975), 31–36. (Original paper.)

In 1963 at the graph theory conference in Smolenice, Czechoslovakia, G. Ringel conjectured that: For any tree  $T$  with  $n$  edges the complete graph on  $2n + 1$  vertices can be decomposed into  $2n + 1$  subgraphs  $T_0, T_1, \dots, T_{2n}$  such that  $T_i \cong T$  for  $i = 0, 1, \dots, 2n$ . Rosa modified the conjecture by constraining how the trees  $T_i$  for  $i = 1, 2, \dots, 2n$  were determined by the tree  $T_0$  and proved that the modified conjecture was equivalent to finding a certain type of integer valued function defined on the vertices of a tree. The authors of this paper give a sufficient condition for a solution to exist in terms of the adjacency matrix of the tree. Although this sufficient condition seems “easy” to apply to a given tree, there is not as yet an algorithm which tells one how to handle an arbitrary tree.

MILAN TVRDÝ, Praha: *Linear boundary value type problems for functional-differential equations and their adjoints*. Czech. Math. J. 25 (100), (1975), 37–66. (Original paper.)

An analytic form of the adjoints to boundary value type problems for linear functional-differential equations which include the standard functional-differential equations of retarded type (with initial functions continuous or of bounded variation) are derived. Also differential-difference equations in the sense of Delfour and Mitter (with initial functions square integrable) are treated.

MILAN TVRDÝ, Praha: *Note on functional-differential equations with initial functions of bounded variation*. Czech. Math. J. 25 (100), (1975), 67–70. (Original paper.)

It is shown that the Cauchy operator in the variation-of-constants formula for the linear functional-differential equation of retarded type with initial functions of bounded variation is completely continuous (as an operator  $\mathcal{BV}_n(a-r, a) \rightarrow \mathcal{AC}_n(a, b)$ ).

RICHARD C. BROWN, Madison: *Adjoint domains and generalized splines*. Czech. Math. J. 25 (100), (1975), 134–147. (Original paper.)

This paper develops a general theory characterizing the “ $Lg$ -spline” (in a Hilbert space norm) for a regular  $n^{\text{th}}$  order vector differential operator interpolating a general set of functionals represented by measures of bounded variation. The theory is applied to several special cases considered by other authors.

LADISLAV BICAN, Praha: *Completely decomposable abelian groups any regular subgroup of which is completely decomposable.* Czech. Math. J. 25 (100), (1975), 71—75. (Original paper.)

For a completely decomposable torsion free abelian group  $G = \sum_{\alpha \in A} J_{\alpha}$  the set of the types of all direct summands  $J_{\alpha}$  is denoted by  $T(G)$ . For a type  $\hat{\tau}$   $G(\hat{\tau})$  is the subgroup of  $G$  consisting of all the elements of  $G$  having the type  $\geq \hat{\tau}$ . The paper is devoted to the study of the class of completely decomposable groups any regular subgroup of which is completely decomposable, again. Concerning the groups, the type set of which satisfies the maximum condition a full description is obtained. In the general case it suffices to know the class  $\mathfrak{R}$  of all such groups the type set of which contains an infinite increasing sequence  $\hat{\tau}_1 < \hat{\tau}_2 < \dots$  such that for every  $\hat{\tau} \in \hat{\tau}(G)$  there is  $\hat{\tau} \leq \hat{\tau}_n$  for some  $n$ , the set  $\{\hat{\tau}, \hat{\tau} \in \hat{\tau}(G), \hat{\tau} \leq \hat{\tau}_n\}$  is inversely well-ordered for every  $n$  and for every prime  $p$  the inequality  $\tau_n(p) \neq \infty$  holds for a finite number of  $n$ 's only.

YOUSEF ALAVI and GARY CHARTRAND, Kalamazoo: *The existence of 2-factors in squares of graphs.* Czech. Math. J. 25 (100), (1975), 79—83. (Original paper.)

The square  $G^2$  of a connected graph  $G$  is that graph having the same vertex set as  $G$  and such that two vertices of  $G^2$  are adjacent if and only if the distance between these vertices in  $G$  is at most two. A 2-factor of a graph  $G$  is a spanning subgraph of  $G$  which is regular of degree 2. It is shown that if  $G$  is a connected graph having at least three vertices, then a necessary and sufficient condition for  $G^2$  to contain a 2-factor is that there exists in  $G$  no vertex which is the end-vertex of three end-paths of length two.

MIROSLAV DONT, Praha: *On a heat potential.* Czech. Math. J. 25 (100), (1975), 84—109. (Original paper.)

In this paper the author deals with a special type of heat potentials in the Euclidean plane  $R^2$ . Some sufficient and necessary conditions for the existence of boundary limits of those potentials are established. The results of this paper are used in the author's following paper "On a boundary value problem for the heat equation".

MIROSLAV DONT, Praha: *On a boundary value problem for the heat equation.* Czech. Math. J. 25 (100), (1975), 110—133. (Original paper.)

Results presented in the author's previous paper "On a heat potential" concerning the existence of boundary limits of some heat potentials are used in this paper in connection with the representability of the solution of the Fourier boundary problem by means of those potentials.

BOHDAN ZELINKA, Liberec: *Geodetic graphs of the diameter two.* Czech. Math. J. 25 (100), (1975), 148—153. (Original paper.)

The paper concerns properties of geodetic graphs of diameter two, i.e., graphs in which any two non-adjacent vertices are connected exactly by one path of length two. These graphs are characterized in the case when they contain cut-vertices and some properties are found also for the other case.