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(Publication of these summaries is permitted)

BOHDAN ZELINKA, Liberec: *Isotopy of digraphs.* Czech. Math. J. *22* (*97*) (1972), 353—360. (Original paper.)

The concept of isotopy of digraphs is a generalization of the concept of isomorphism. An ordered pair of one-to-one mappings $\langle f_1, f_2 \rangle$ of the vertex set of a digraph G_1 onto the vertex set of a digraph G_2 is called an isotopy of G_1 onto G_2, if and only if the existence of the edge $\overrightarrow{f_1(u) f_2(v)}$ in G_2 is equivalent to the existence of the edge $\overrightarrow{uv}$ in G_1 for any vertices u, v of G_1. An isotopy of a digraph onto itself is called an autotopy. In the paper the properties of isotopies are studied.

MARIO PETRICH, Pennsylvania: *On ideals of a semilattice.* Czech. Math. J. *22* (*97*), (1972), 361—367. (Original paper.)

In the paper S can be defined as a commutative idempotent semigroup or as a partially ordered set in which any two elements have g.l.b. We first consider S as a semigroup giving a characterization of semilattices among all semigroups in terms of bitranslations, and then prove that every bitranslation of a semilattice S is induced by retraction onto an ideal. We then consider S both as a semigroup and a poset in discussing various (lower) subsemilattices of the lattice $\mathscr{I}$ of all ideals of S such as: the idealizer of the subsemilattice of principal ideals, the normal completion of S, injective hull in the category of semilattices, and present some examples for illustration.

TEO STURM, Praha: *Äquivalenz- und Ordnungsrelationen.* Czech. Math. J. *22* (*97*), (1972), 373—392. (Originalartikel.)

Diese Arbeit knüpft unmittelbar an den Artikel „Verbände von Kernen isotoner Abbildungen" (Czech. Math. J. *22* (*97*), (1972), 126—144). In deren ersten Teil wird das System aller Ordnungen einer nichtleeren Menge A studiert, mit Rücksicht auf welche eine gegebene Äquivalenz schwach faktorisierend ist. Im zweiten Teil ist dann eine Charakterisierung einer Äquivalenz auf A mittels passender Ordnungen auf A gegeben; insbesondere werden Ordnungssysteme gesucht, welche minimal mit Rücksicht zu der Inklusion sind und welche die Äquivalenz auf diese Weise charakterisieren.

TIBOR KATRIŇÁK, Bratislava: *Die Kennzeichnung der beschränkten Brouwerschen Verbände.* Czech. Math. J. *22* (*97*), (1972), 427—434. (Originalartikel.)

Ein beschränkter Brouwescher Verband ist ein spezieller distributiver pseudokomplementärer Verband. Die distributiven pseudokomplementären Verbände lassen eine Tripelcharakterisierung zu, d. h. sie sind eindeutig durch einen Booleschen Verband B, einen distributiven Verband D mit 1 und eine gewisse Abbildung Φ von B in den Filterverband $F(D)$ des Verbandes D bestimmt. Die Arbeit beschreibt die Tripelkonstruktion der beschränkten Brouwerschen Verbände und bringt eine neue Kennzeichnung dieser Verbände.

A. M. BRUCKNER and J. CEDER, Santa Barbara: *On jumping functions by connected sets*. Czech. Math. J. *22* (*97*), (1972), 435—448. (Original paper.)

This article establishes and studies a unifying relationship between several classes of functions, including the classes of Darboux functions, connected functions and continuous functions. This relationship is in terms of various kinds of connected sets which "jump" the function.

N. P. MUKHERJEE, Morgantown: *Quasicommutative semigroups* I. Czech. Math. J. *22* (*97*), (1972), 449—453. (Original paper.)

The kern of a group G is the totality of all elements in G each of which normalises every subgroup of G and it is well known that the kern is a subgroup which is either Abelian or Hamiltonian. Following the idea of the kern we introduce here the idea of quasicommutativity and investigate the structure of quasicommutative semigroups.

JAROSLAV KURZWEIL, Praha: *On submultiplicative nonnegative functionals of linear maps of linear finitedimensional normed spaces*. Czech. Math. J. *22* (*97*), (1972), 454—461. (Original paper.)

It is shown that a certain inequality involving submultiplicative functionals and norms of linear maps cannot be strenghtened by diminishing a certain constant.

IVAN NETUKA, Praha: *An operator connected with the third boundary value problem in potential theory*. Czech. Math. J. *22* (*97*), (1972), 462—489. (Original paper.)

Operators W and V acting on the space of all bounded Baire functions defined on the compact boundary B of an open set $G \subset R^m$ are studied. The former operator is connected with the double layer potential and the latter with the Newtonian potential of a certain measure λ having support in B. The operator $T = W + V$ is closely related to the third boundary value problem in potential theory (see also I. Netuka: Generalized Robin problem in potential theory, Czech. Math. J. *22* (*97*), (1972), 312—324). The Fredholm-like radius ΩT_α of the operator T_α defined by $T = \alpha I + T_\alpha$ (I is the identity operator, α is a real number) is expressed in terms of the geometric shape of G and the distribution of λ over B and the optimal value of α for which $|\alpha|\ \Omega T_\alpha$ attains its maximal value is determined. The necessary and sufficient conditions guaranteeing compactness of the operator V are also given.

HÉCTOR J. SUSSMANN, Chicago: *The control problem* $\dot{x} = A(u)\, x$. Czech. Math. J. *22* (*97*), (1972), 490—494. (Original paper.)

In this article we study the structure of the attainable sets corresponding to the control problem $\dot{x} = A(u)\, x$, where x is a (column) vector in n-dimensional space $\mathbf{R}^n$, $u = (u_1, u_2, \ldots, u_m)$, where $0 \leqq u_i \leqq 1$ for $i = 1, \ldots, m$ and $A(u)$ is an $n \times n$ matrix-valued polynomial in the u_i's. Our results are a generalization of those of Kučera, which correspond to the case $m = 1$, $A(u) = C + Bu$.

EBERHARD GERLACH, Vancouver: *On the characterization of weak closure in Hilbert space.* Czech. Math. J. *22 (97)*, 368—372. (Original paper.)

The purpose of this note is an attempt to characterize the weak closure of bounded sets in a separable Hilbert space. The problem was motivated by a recent paper of G. E. Šilov, in which he studies the Lévy-Laplace operator on a particular class of norm-closed domains in Hilbert space. Šilov showed that these domains are weakly compact and that the nullspace of the Lévy-Laplacian is a dense algebra in the algebra of all weakly continuous functions on the given domain. It turns out that the algebra considered by Šilov, or equivalently the algebra generated by all continuous linear functionals, on a given bounded set B is precisely that algebra of bounded weakly continuous functions which corresponds to the compactification given by the weak closure of B. It would be natural to expect this compactification of B to be "distinguished" in some way; examples suggest, however, that the weak closure may not enjoy any special properties not shared by other compactifications. We conclude the note with a few open problems.

IVO VRKOČ, Praha: *Conditions for maximal local diffusions in multidimensional case.* Czech. Math. J. *22 (97)*, (1972), 393—422. (Original paper.)

Let a class of vector Îto equations (1) $\mathrm{d}x = a(t, x)\,\mathrm{d}t + B(t, x)\,\mathrm{d}w(t)$ be given in a region $Q = (0, L) \times D$, $D \subset R_n$. The matrix functions $B(t, x)$ fulfil the condition: $B^*(t, x)\, B^{*T}(t, x) - B(t, x)\, B^T(t, x)$ is positive semidefinite matrix in every $[t, x] \in Q$ where $B^*(t, x)$ is a given matrix function. The matrix function $B^*(t, x)$ is called strongly maximal if the probability $P(x(t), B(t, x))$ that the solution $x(t)$ of (1) with a fixed initial value $x_0 \in D$ leaves the region D within the time interval $(0, L)$ is maximal for $B = B^*$. There are given some necessary conditions for maximality of B^* and some sufficient conditions for maximality of B^* in the case that L is small or that L is great but the coefficients on the right hand side of (1) (for $B = B^*$) are small.

HÉCTOR J. SUSSMANN, Chicago: *The control problem* $\dot{x} = (\mathrm{A}(1 - u) + \mathrm{B}u)\, x$*: A comment on an article by J. Kučera.* Czech. Math. J. *22 (97)*, (1972), 423—426. (Original paper.)

In an article recently published in this Journal, J. Kučera studied the control problem $\dot{x} = (\mathrm{A}(1 - u) + \mathrm{B}u)\, x$. The main results of this paper are that the set $\mathscr{A}(\omega, T)$ of points attainable at time $T > 0$ from a fixed point ω is an "integral manifold of the distribution $\mathscr{B}(\mathrm{A}, \mathrm{B})$", and that the set $\mathscr{A}'(\omega, T) = \bigcup \{\mathscr{A}(\omega, T) : 0 \leqq t \leqq T\}$ is an "integral manifold of the distribution $\mathscr{U}(\mathrm{A}, \mathrm{B})$". The purpose of this note is to show that Lemma 2.8 of the paper by Kučera, which is a fundamental step in the proof of Theorems 2.1 and 2.2, is false. The natural question to be asked now is whether these results are nevertheless valid; it will be shown in a forthcoming paper that they are. The proof, however, is based on a completely different technique.

BŘETISLAV NOVÁK, Praha: *Über Gitterpunkte in mehrdimensionalen Ellipsoiden.* Czech. Math. J. *22 (97)*, (1972), 495—507. (Originalartikel.)

In diesem Artikel untersucht der Autor O- und Ω-Abschätzungen für die Funktion $P_\varrho(x) = (1/\Gamma(\varrho)) \int_0^x P(t)\,(x - t)^{\varrho - 1}\,\mathrm{d}t$, wo $P(x)$ der bekannte Giterrest in der Theorie der Gitterpunkte in mehrdimensionalen Ellipsoiden mit Gewichten ist.