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SUMMARIES OF ARTICLES PUBLISHED IN THIS ISSUE

(Publication of these summaries is permitted)

JOHN C. HIGGINS, Provo: *A faithful canonical representation for finitely generated N-semigroups.* Czech. Math. J. *19* (*94*), (1969), 375—379. (Original paper.)

A N-semigroup has been represented by Tamura as the Cartesian product of an abelian group and the additive positive integers with a special operation. This paper shows how, for finitely generated N-semigroups, one may obtain canonical representations in terms of distinguished elements of the semigroup. It also gives criteria for determining when two such representations represent isomorphic N-semigroups.

NORMAN NOBLE, Worcester: *Countably compact and pseudocompact product.* Czech. Math. J. *19* (*94*), (1969), 390—397. (Original paper.)

Following Frolík, we use $\mathfrak{C}$ (resp. $\mathfrak{P}$) to denote the class of spaces X such that $X \times Y$ is countably compact (resp. pseudocompact) whenever Y is. In the first section we show that countably compact k-spaces (indeed, countably compact spaces in which each non-P-point is a k-point) are in $\mathfrak{C}$. Corresponding results for pseudocompact spaces are given in the second section and in the third section we prove that the class $\mathfrak{P}$ is closed under arbitrary products.

ŠTEFAN SCHWABIK, Praha: *Stetige Abhängigkeit von einem Parameter und invariante Mannigfaltigkeiten für verallgemeinerte Differentialgleichungen.* Czech. Math. J. *19* (*94*), (1969), 398—427. (Originalartikel.)

Es werden verallgemeinerte Differentialgleichungen behandelt, welche unstetige Funktionen als Lösungen zulassen und mit deren Hilfe man Prozesse mit in gewissen Zeitpunkten wirkenden Impulsen beschreiben kann.

MIROSLAV FIEDLER and VLASTIMIL PTÁK, Praha: *Cyclic products and an inequality for determinants.* Czech. Math. J. *19* (*94*), (1969), 428—451. (Original paper.)

A new inequality for square matrices is introduced as follows: $A \overset{w}{\geqq} B$ if every cyclic product of the matrix A is $\geqq$ than the corresponding cyclic product of B. This inequality is used to prove a generalization of Kotelanski's determinantal inequality and to discuss completely the case of equality.

JIŘÍ VANŽURA, Praha: *Invariants of submanifolds.* Czech. Math. J. *19* (*94*), (1969), 452—468. (Original paper.)

The Author studies scalar geometric invariants of submanifolds of a given manifold, provided with the geometric structure by giving a sheal of germs of vector fields on it. These invariants are generalization of those known from the classical geometries.

MARIE KOPÁČKOVÁ-SUCHÁ, Praha: *On the weakly nonlinear wave equation involving a small parameter at the highest derivative.* Czech. Math. J. *19* (*94*), (1969), 469—491. (Original paper.)

The paper deals with the equation $L_\varepsilon u \equiv \varepsilon u_{tt} - u_{xx} + 2au_t + cu = g(t, x) + \varepsilon f(t, x, u, u_x, u_t)$ where ε is a sufficiently small positive number, $t \geqq 0$, $x \in E_1$. The existence and uniqueness of the solution of the Cauchy problem and of the periodic solution for this equation is proved. The behaviour of these solutions for $\varepsilon \to 0$ is studied.

ALOIS ŠVEC, Praha: *Submanifolds of Klein spaces.* Czech. Math. J. *19* (*94*), (1969), 492—499. (Original paper.)

It is shown that for the solution of the equivalence problem for submanifolds in Klein spaces only a finite process is needed.

IVO VRKOČ, Praha: *The class of functions fulfilling the inequality* $\|f(x + z) - f(x) - f(y + z) + f(y)\| \leqq \|x - y\| \, \omega(\|z\|)$. Czech. Math. J. *19* (*94*), (1969), 500—514. (Original paper.)

In the article transformations $f: D \to B$, $D \subset A$ are investigated where A is a linear space with a semi-norm and B is a Banach space. Conditions are given for f to have the unique extension f^* on a set $L(D)$ and for the extension f^* to have the Gateaux differential at every point of D.

JIŘÍ VANŽURA, Praha: *Remark on involutive subspaces and regular bases.* Czech. Math. J. *19* (*94*), (1969), 515—517. (Original paper.)

Given an involutive subspace $g^k \subset W \otimes S^k V^*$ and a subspace $V_1 \subset V$ of dimension r there is a regular basis $v_1, \ldots, v_n$ of a suitable prolongation g^{k_0} of g^k such that $v_1, \ldots, v_r \in V_1$.

LADISLAV BICAN, Praha: *Some properties of completely decomposable torsion free abelian groups.* Czech. Math. J. *19* (*94*), (1969), 518—533. (Original paper.)

In this paper there are studied the conditions for the isomorphism $G \cong H$ where H is a completely decomposable torsion free abelian group and G a torsion free extension of H (subgroup of H, respectively). These conditions are formulated in terms of imbedding of H in G (G in H, respectively). As consequences some new criteria for complete decomposability of a torsion free abelian group are obtained.

JINDŘICH VEVERKA, Brno: *On couples of line congruences with the projective connection having Rozenfeld image with the character smaller than* 5. Czech. Math. J. *19* (*94*), (1969), 534—546. (Original paper.)

The Author studies the couples of non-parabolic line congruences in a three-dimensional space and in the space with the projective connection having Rozenfeld image in a five-dimensional projective space with a character smaller than five. Necessary and sufficient conditions for the character of Rozenfeld image to be smaller than five are found.

VLASTIMIL PTÁK, Praha: *Openness of linear mappings in LF-space*. Czech. Math. J. *19* (*94*), (1969), 547—552. (Original paper.)

Let E and F be two LF-spaces and T a sequentially open mapping of E into F. If we denote by R the range of T then R is sequentially closed in F. In the present paper we define a notion of orthogonality for subspaces R of spaces of type LF which describes the mutual position of R and the spaces of a defining sequence. Roughly speaking, R is said to be orthogonal in F provided R does not get too close, with increasing j, to the spaces of a defining sequence F_j (this is shown to be independent of the choice of a defining sequence). If T is sequentially open and if the range R of T is orthogonal in F then T is open.

VLASTIMIL PTÁK, Praha: *Simultaneous extensions of two functionals*. Czech. Math. J. *19* (*94*), (1969), 553—566. (Original paper.)

Giwen two subspaces R and Y of a Banach space F and two continuous linear functionals $r^* \in R'$ and $y^* \in Y'$ which coincide on $R \cap Y$, does there exist a continuous linear functional $x' \in F'$ which extends both r^* and y^*? Clearly this is not always true. On the other hand, if the mutual position of R and Y is favourable, simultaneous extensions exist. There is also an intermediate situation where extensions do not exist, but the problem may be solved approximately: given $\varepsilon > 0$ there exists a $z' \in F'$ which is an extension of r^* and such that its restriction to Y differs from y^* less than ε in the norm of Y'. Necessary and sufficient conditions for each of these cases are given. In a forthcoming note they will be applied to the study of open mappings in spaces of type LF.

LADISLAV MIŠÍK, Bratislava: *Über f-durchschnittliche Eigenschaften*. Czech. Math. J. *19*(*94*), (1969), 380—389. (Originalartikel.)

Hier ist die Frage für einige Mengeneigenschaften studiert, ob sie f-durchschnittlich oder nicht f-durchschnittlich sind.