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SUMMARIES OF ARTICLES PUBLISHED IN THIS ISSUE

(Publication of these summaries is permitted)

KRISHNA MURAVI GARG, Edmonton: *On a residual set of continuous functions.* Czech. Math. J. *20* (*95*), (1970), 537—543. (Original paper.)

Banach and Mazurkiewicz proved in 1931 that the non-differentiable functions $f \in C$ form a residual subset of the space. In 1933, Jarník established some results concerning Dini derivatives of functions in C. The present paper investigates further these results, strengthens some of them and presents some new results.

HUGO D'ALARCAO, Stony Brook: *Biregular semigroups, I, II.* Czech. Math. J. *20* (*95*), (1970), 544—548, 549—555. (Original paper.)

A semigroup S is biregular if each principal two-sided ideal of S is generated by an idempotent in the centre of S. This generalizes the concept of an inverse semigroup which is a union of groups. Biregular semigroups are studied.

JOSEF KRÁL, Praha: *Flows of heat and the Fourier problem.* Czech. Math. J. *20* (*95*), (1970), 565—598. (Original paper.)

Let D be an open set with a compact boundary B in R^m, $m > 1$. With each signed measure μ whose support is contained in $B \times \langle T_1, T_2 \rangle$ $(T_1 < T_2)$ a distribution $H\mu$ (called the heat flow) is associated characterizing weakly the normal derivative of the heat potential induced on $D \times (T_1, T_2)$ by μ. The operator $H : \mu \to H\mu$ and its applications to the Fourier problem are investigated.

PAUL R. FALLONE, Jr., Storrs: *Some remarks concerning stable attractors.* Czech. Math. J. *20* (*95*), (1970), 599—602. (Original paper.)

The following theorem was proved by Bhatia and Szegö: Let (X, π) be a dynamical system on the locally compact metric space X. If $M \subset X$ be compact, invariant, and (positively) asymptotically stable, then there is a real valued continuous mapping, $v : A(M) \to R^+$, from the region of attraction of M into the non-negative reals which is uniformly unbounded on $A(M)$ and, in addition, satisfies: $v(x) = 0$ iff $x \in M$; $v(\pi(x, t)) \equiv e^{-t} v(x)$ for every $(x, t) \in A(M) \times R$. We wish to establish some consequences of this theorem.

VLASTIMIL DLAB, Ottawa: *Lattice formulation of general algebraic dependence.* Czech. Math. J. *20* (*95*), (1970), 603—615. (Original paper.)

In the paper we introduce certain properties of lattices to be able to prove the invariance of the rank of a lattice, as well as of some other cardinal numbers (useful in universal algebra applications). As an application of our results to an arbitrary (upper) semimodular lattice, we get following result: All maximal independent subsets of atoms of a semimodular lattice have the same cardinality. Also, the relation between direct dependence and J. von Neumann's dependence is desribed.

L. CARLITZ, Durham: *Reduction formulas for certain multiple exponential sums.* Czech. Math. J. *20* (*95*), (1970), 616—627. (Original paper.)

Let F denote the finite field of order $q = p^n$, p a prime, $n \geqq 1$. Put $t(a) = a + a^2 + \ldots a^{p^{n-1}}$, $e(a) = e^{2\pi i t(a)}$, $K_1(a) = \sum_{x \neq 0} e(x + ax')$, $K_2(a) = \sum_{x \neq 0, y \neq 0} e(x + y + axy')$. In the paper we consider sums of the type $S(Q, L) = \sum_{(x)} e\{L(x) + (Q(x))^{-1}\}$, where $L(x)$ is a linear form and $Q(x)$ a quadratic form in $x_1, x_2, \ldots, x_s$ with coefficients in F and the summation is over all x_j in F such that $Q(x) \neq 0$. We find that for $p = 2$ and s even, $S(Q, L)$ reduces essentially to $K_2(a)$; for s odd it reduces to $K_1(a)$. For $p > 2$ and s even we find that $S(Q, L)$ reduces essentially to $K_2(a)$; for s odd, on the other hand, we require a variant of $K_1(a)$, namely $K'(a) = \sum_{u \neq 0} e(u + au^{-2})$.

KONRAD JACOBS, Erlangen: *Systemes dynamiques Riemanniens.* Czech. Math. J. *20* (*95*), (1970), 628—631. (Mémoire scientifique original.)

Nous donnos des méthodes de modification des systèmes dynamiques, qui permettent, en sortant du cadre useul de la dynamique topologique, et en y rentrant ensuite, de construire des mesures faiblement mélangeantes portées par des ensembles strictement ergodiques.

ŠTEFAN SCHWARZ, Bratislava: *On the semigroup of binary relations on a finite set.* Czech. Math. J. *20* (*95*), (1970), 632—679. (Original paper.)

Let Ω be a finite set, $B(\Omega)$ the semigroup of all binary relations on Ω and ϱ any element $\in B(\Omega)$. The majority of results concerns the algebraic and arithmetical properties of the subsemigroup of $B(\Omega)$ generated by ϱ.

IVAN DOBRAKOV, Bratislava: *On integration in Banach spaces, II.* Czech. Math. J. *20* (*95*), (1970), 680—695. (Original paper.)

In this second part of our paper we present the theory of L_p spaces for our integration theory of vector valued functions with respect to an operator valued measure countably additive in the strong operator topology.

ŠTEFAN SCHWARZ, Bratislava: *On idempotent binary relations on a finite set.* Czech. Math. J. *20* (*95*), (1970), 696—702. (Original paper.)

Let Ω be a finite set. A method how to find all idempotent binary relations on Ω is described.

ŠTEFAN SCHWARZ, Bratislava: *On a sharp estimation in the theory of binary relations on a finite set.* Czech. Math. J. *20* (*95*), (1970), 703—714. (Original paper.)

Let ϱ be an irreducible binary relation on a finite set. Let $k = k(\varrho)$ be the least positive integer such that ϱ^k appears in the sequence $\varrho, \varrho^2, \varrho^3, \ldots$ more than once. A sharp estimation for the number k is given.