Contents

A. KLIMCZAK, M. PRAŻMOWSKA: Desarguesian closure of binomial graphs 245–253
W. KORCZYŃSKI: A note on an algebraic characterization of higher level hypergraphs and higher level partitions 255–265
YOUNG BAE JUN, HEE SIK KIM, J. NEGGERS: Porings and poring algebras 267–276
I. KIMURA: Divisibility of orders of K2 groups associated to quadratic fields 277–284
F. S. ABU MURIEFAH: On the diophantine equation \( x^2 + 5^k = y^n \) 285–289
J. VUKMAN: Identities with products of \((\alpha, \beta)\)-derivations on prime rings 291–298
P. ANDRZEJEWSKI, B. GLANC: A note on the commutativity of rings 299–303
W. JABŁOŃSKI: On some subsemigroups of the groups \( L^1 \) and \( L^\infty \) 305–316
M. BAKONYI, D. TIMOTIN: A remark on positive definite functions on free groups 317–320
B. G. PACHPATTE: A note on new integral inequalities of Grüss type 321–326
M. GRANDE: On the product of two functions which are approximately continuous and approximately regulated 327–334
A. SIBELSKA: On some coefficient conditions for complex harmonic mappings with a pole at the infinity 335–346
A. LEŚNIEWSKI, T. RZEZUCHOWSKI: Autonomous differential inclusions sharing the families of trajectories 347–356
LE HOAN HOA, LE THI PHUONG NGOC: The connectivity and compactness of solution set of an integral equation and weak solution set of an initial-boundary value problem 357–376
O. T. POP: About some linear and positive operators defined by infinite sum 377–388
N. HUSSAIN: Common fixed point and invariant approximation results 389–400
W. T. SULAIMAN: Extension on Hardy–Hilbert’s integral inequality and its applications 401–410
J. DRONKA, L. OLSZOWY: The superposition operator for vector-valued functions on a noncompact interval 411–418
L. B. ĆIRIĆ: Common fixed point theorems for set-valued mappings 419–428
B. TURAN: Order properties of the space of \( A \)-linear operators 429–438
B. KUNA: On residuaillities in the set of Markov continuous semigroups on \( C_1 \) 439–453
K. PUPKA: Remarks on fixed points of involutions of order \( n > 2 \) in Hilbert spaces 455–463
G. HERZOG, A. WEBER: A class of hypercyclic Volterra composition operators 465–468
P. MICHALEC: Lifting of vector fields to 1-forms on \( r \)-jet prolongation of the bundle of tensors of type \((0, 2)\) 471–481
Aleksandra Klimczak, Małgorzata Prażmowska

DESARGUESIAN CLOSURE OF BINOMIAL GRAPHS

Abstract. In the paper we study configurations which are obtained as Desarguesian closure of binomial graphs. Their parameters are calculated, and their automorphisms are determined.

Waldemar Korczyński

A NOTE ON AN ALGEBRAIC CHARACTERIZATION OF HIGHER LEVEL HYPERGRAPHS AND HIGHER LEVEL PARTITIONS

Abstract. In the paper the duality of the notions of (higher) hypergraph and (higher) partition is shown. Both higher level hypergraphs and higher partitions are characterized algebraically as left and right regular bands.

Young Bae Jun, Hee Sik Kim, J. Neggers

PORINGS AND PORING ALGEBRAS

Abstract. In this paper we define an algebra of type $(2, 2, 0)$ associated with posets called a poring and we study several properties of porings and the linear algebras having such porings as their bases. In particular, we show that if $(P; *, ·)$ is a standard poring then the distributive law $(x · y) * z = (x * z) · (y * z)$ holds if the poset $P$ (or the poset $X$) is $(C_2 + 1)$-free.

Iwao Kimura

DIVISIBILITY OF ORDERS OF $K_2$ GROUPS associated to quadratic fields

Abstract. We discuss some divisibility results of orders of $K$-groups and cohomology groups associated to quadratic fields.

Fadwa S. Abu Muriefah

ON THE DIOPHANTINE EQUATION $x^2 + 5^{2k} = y^n$

Abstract. In this paper we prove that the title equation where $k \geq 0$ and $n \geq 3$, may have a solution in integers $(x, y, k, n)$ only if $5|x$ and $p \nmid k$, where $p$ any odd prime
dividing n, by using a recent result of Bilu, Hanrot and Voutier [3].

**Joso Vukman**

**IDENTITIES WITH PRODUCTS OF \((\alpha, \beta)\)-DERIVATIONS ON PRIME RINGS**

**Abstract.** The main purpose of this paper is to prove the following result. Let \(R\) be a noncommutative prime ring of characteristic different from two and let \(D\) and \(G \neq 0\) be \((\alpha, \beta)\)-derivations of \(R\) into itself such that \(G\) commutes with \(\alpha\) and \(\beta\). If \([D(x), G(x)] = 0\) holds for all \(x \in R\) then \(D = \lambda G\) where \(\lambda\) is an element from the extended centroid of \(R\).

**Paweł Andrzejewski, Barbara Glanc**

**A NOTE ON THE COMMUTATIVITY OF RINGS**

**Abstract.** Sufficient conditions for commutativity of rings are proved. They generalize or are related to certain old results due to I. N. Herstein and others, see [1] and [5].

**Wojciech Jabłoński**

**ON SOME SUBSEMIGROUPS**

of the groups \(L^1_s\) and \(L^1_{\infty}\)

**Abstract.** The problem of determination of some class of geometric objects has been reduced about forty years ago to consideration of some subsemigroups of the differential group \(L^1_s\) (cf. [?] and [?]). Over the last years many papers has been devoted the problem of determining of subsemigroups and subgroups of the group \(L^1_s\) (see among others [?], [?] and [?]-[?]). In this paper we are going to generalize the results from [?], [?] and [?] concerning determination of some form subsemigroups of the group \(L^1_s\).

**Mihály Bakonyi, Dan Timotin**

**A REMARK ON POSITIVE DEFINITE FUNCTIONS ON FREE GROUPS**

**Abstract.** A simple example is given of a finitely supported positive definite function on the free group with two generators, whose sum of values is strictly negative.

**B. G. Pachpatte**

**A NOTE ON NEW INTEGRAL INEQUALITIES OF GRÜSS TYPE**

**Abstract.** The aim of this note is to establish two new Grüss type integral inequalities
involving functions and their derivatives by using a fairly elementary analysis.

Marcin Grande

**ON THE PRODUCT OF TWO FUNCTIONS WHICH ARE APPROXIMATELY CONTINUOUS AND APPROXIMATELY REGULATED**

**Abstract.** In this article we investigate the products of two unilaterally approximately continuous and simultaneously approximately regulated functions. In particular we prove some necessary conditions satisfied by the products of two such functions and a sufficient condition ensuring that a function is the product of two such functions.

Agnieszka Sibelska

**ON SOME COEFFICIENT CONDITIONS FOR COMPLEX HARMONIC MAPPINGS WITH A POLE AT THE INFINITY**

**Abstract.** In 1984 J. Clunie and T. Sheil-Small initiated studies of complex functions harmonic in the unit disc. In 1987 W. Hergartner and G. Schober considered mappings of this type, defined in the domain \( \tilde{U} = \{ z \in \mathbb{C} : |z| > 1 \} \). Several mathematicians examine classes of complex harmonic functions with some coefficient conditions, defined in the unit disc (e.g. [?], [?], [?], [?], [?]) or in \( \tilde{U} \) (e.g. [?], [?]).

We investigate the classes of mappings harmonic in \( \tilde{U} \) with coefficient conditions more general than the considered in paper [?].

Andrzej Leśniewski, Tadeusz Rzeżuchowski

**AUTONOMOUS DIFFERENTIAL INCLUSIONS SHARING THE FAMILIES OF TRAJECTORIES**

**Abstract.** We give a sufficient condition for equality of sets of trajectories of two differential inclusions with right-hand sides Borel measurable with respect to the state variable, not necessarily bounded and possibly containing the origin.

Le Hoan Hoa, Le Thi Phuong Ngoc

**THE CONNECTIVITY AND COMPACTNESS OF SOLUTION SET OF AN INTEGRAL EQUATION AND WEAK SOLUTION SET OF AN INITIAL-BOUNDARY VALUE PROBLEM**

**Abstract.** In this paper we show that the set of solutions to the following integral equation

\[
x(t) = \int_0^t f(s, x(s)) \, ds + \int_0^t g(t, s, x(s)) \, ds, \quad t \geq 0,
\]
and that of weak solutions to the initial-boundary value problem for the following semilinear wave equation are nonempty, connected and compact

\[
\begin{align*}
&u_{tt} - u_{xx} + f(u, u_t) = 0, \quad 0 < x < 1, \quad 0 < t < T, \\
&u_x(0, t) = P(t), \quad u(1, t) = 0, \\
&u(x, 0) = u_0(x), \quad u_t(x, 0) = u_1(x).
\end{align*}
\]

where \(u_0, u_1, f\) are given functions, the unknown function \(u(x, t)\) and the unknown boundary value \(P(t)\) satisfy the following nonlinear integral equation

\[
P(t) = g(t) + H(u(0, t)) - \int_0^t k(t - s)u(0, s)ds,
\]

where \(g, H, k\) are given functions. The main tool is the topological degree theory of compact vector fields.

Ovidiu T. Pop

ABOUT SOME LINEAR AND POSITIVE OPERATORS DEFINED BY INFINITE SUM

Abstract. In [13], we study a class of linear and positive operators defined by finite sum. In this paper we demonstrate general properties for a class of linear positive operators defined by infinite sum. By particularization, we obtain statements, the convergence and the evaluation for the rate of convergence in term of the first modulus of smoothness for the Mirakjan-Favard-Szász operators, Baskakov operators and Mayer-König and Zeller operators. We don’t study the convergence of these operators with the well known theorem of Bohman-Korowkin.

Nawab Hussain

COMMON FIXED POINT AND INVARIANT APPROXIMATION RESULTS

Abstract. We extend the concept of R-subweakly commuting maps due to Shahzad [21] to the case of non-starshaped domain and obtain common fixed point results for this class of maps on non-starshaped domain in the setup of \(p\)-normed spaces. As applications, we establish Brosowski-Meinardus type approximation theorems. Our results unify and extend the results of Al-Thagafi, Dotson, Habiniak, Jungck and Sessa, Sahab, Khan and Sessa, Singh and Shahzad.

Waad T. Sulaiman

EXTENSION ON HARDY–HILBERT’S INTEGRAL INEQUALITY AND ITS APPLICATIONS

Abstract. In this paper, by introducing some parameters, new forms of Hardy–
Hilbert’s inequalities are given.

Janusz Dronka, Leszek Olszowy
THE SUPERPOSITION OPERATOR FOR VECTOR-VALUED FUNCTIONS ON A NONCOMPACT INTERVAL
Abstract. In this paper the superposition operator in the space of vector-valued, bounded and continuous functions on a noncompact interval is considered. Acting conditions and criteria of continuity and compactness are established. As an application, an existence result for the nonlinear Hammerstein integral equation in this space is obtained.

Ljubomir B. Ćirić
COMMON FIXED POINT THEOREMS FOR SET-VALUED MAPPINGS
Abstract. Some common fixed point theorems for a pair of multi-valued non-self mappings in complete convex metric spaces are obtained. Our results generalize some of the known results. In particular, a theorem by Rhoades [15] is generalized and improved.

Bahri Turan
ORDER PROPERTIES OF THE SPACE of $A$-linear operators
Abstract. Let $A$ be an $f$-algebra with unit and $L, M$ be two topologically full $f$-modules on $A$. We prove that the space of $A$-linear operators $L_b(L, M; A)$ is a Riesz space and we study the order properties of the adjoint operator from $L_b(L, M; A)$ to $L_b(L^*, M^*; (A^*)^*)$. The main result given here describes the centre of the space of $L_b(L, M; A)$.

Beata Kuna
ON RESIDUALITIES IN THE SET OF MARKOV CONTINUOUS SEMIGROUPS ON $C_1$
Abstract. We show that the set of all stochastic strongly continuous semigroups on $C_1$ such that $\lim_{t \to \infty} |||T(t) - Q_{X^*}||| = 0$, where $Q_{X^*}$ is one-dimensional projection for some state $X^*$, is norm open and dense. Moreover this set forms a norm dense $G_δ$ if a state $X^*$ is strictly positive.

Krzysztof Pupka
REMARKS ON FIXED POINTS OF INVOLUTIONS OF ORDER $n > 2$ IN HILBERT SPACES
Abstract. Suppose that \( C \) is a nonempty bounded closed and a convex subset of a Hilbert space \( H \) and \( T: C \rightarrow C \) is \( k \)-lipschitzian or uniformly \( k \)-lipschitzian mapping which has the property that, for some \( n > 1 \), \( T^n \) is the identity. The author determines a function \( k_0(n) > 1 \) such that for \( k < k_0(n) \) mapping \( T \) has a fixed points in \( C \).

Gerd Herzog, Andreas Weber

A CLASS OF HYPERCYCLIC VOLterra
COMPOSITION OPERATORS

Abstract. We prove that certain Volterra composition operators are hypercyclic on the Fréchet space of all continuous functions \( u: [0, 1) \rightarrow \mathbb{R} \) or \( \mathbb{C} \) with \( u(0) = 0 \).

Zafer Ercan, Süleyman Önal

A NEW PROOF OF THE LATTICE-VALUED
BANACH–STONE THEOREM

Abstract. We present a very simple proof of a theorem (in [1]) on support of a Riesz homomorphism.

Pawe Michalec

LIFTING OF VECTOR FIELDS TO 1-FORMS ON \( r \)-JET

prolongation of the bundle of tensors of type \((0,2)\)

Abstract. For natural numbers \( n \geq 2 \) and \( r \geq 1 \) all natural operators \( T_{|M^r} \rightarrow T^* (J^r (\otimes^2 T^*)) \) lifting vector fields from \( n \)-manifolds \( M \) into 1-forms on \( J^r (\otimes^2 T^*) (M) \) are classified. It’s proved that the set of all natural operators \( A: T_{|M^r} \sim T^* (J^r (\otimes^2 T^*)) \) is a free \((4r+3)\)-dimensional \( C^\infty (\mathbb{R}^{r+1}) \) module and we construct explicitly the basis of this module.