M. V. Zabolotsky, S. I. Tarasyuk

**LOWER ESTIMATES FOR THE QUANTITY TYPE AND LOWER TYPE**
**$\delta$ -SUBHARMONIC FUNCTIONS OF ORDER LESS THAN 1**

*We obtain sharp lower estimates for the quantity of type and lower type for an important class of $\delta$-subharmonic $\mathbb{R}^m, m \geq 2$, functions $u = u_1 - u_2$ of order $\rho$, $0 < \rho < 1$. This class is characterized by the condition that Riesz masses of subharmonic functions $u_1$ and $u_2$ are concentrated on the negative and positive rays $Ox_1$ respectively.*

L. V. Yonyk

**GROUPS WITH THE MINIMAL CONDITION ON
NON-«FINITE-BY-NILPOTENT» SUBGROUPS**

*We characterize the groups in which no non-trivial section is perfect and such that any strictly descending series of non-«finite-by-nilpotent» subgroups is finite.*

I. I. Lishchynsky

**ON DERIVATIONS OF NEAR-RINGS**

*We study the connections of* $\mathrm{scp}^{+}$ *-derivations and generalized Daif-derivations with the commutativity of a near-ring.*

N. M. Pyrch

**M-EQUIVALENCE OF PAIRS AND MAPPINGS**

*In the paper we investigate relation between the M-equivalence of mappings and M-equivalence of pairs of Tikhonov spaces. We also give the classification of the retract pairs.*

I. Z. Stasyuk

**OPERATORS OF SIMULTANEOUS EXTENSION OF PARTIAL ULTRAMETRICS**

*We consider the problem of simultaneous extension of continuous ultrametrics defined on compact subsets of a metrizable zero dimensional compact space X. Each ultrametric identified with its graph, is considered as an element of the space of nonempty compact subsets of the set $X \times X \times \mathbb{R}$ endowed with the Vietoris topology. We construct an operator extending ultrametrics which at the same time has the properties of the extension operators introduced in the papers of Tymchatyn, Zarichnyi and the author. In particular the operator is continuous, homogeneous and preserves the operation of pointwise maximum of ultrametrics.*

L. S. Babjak-Biletska, O. L. Horbachuk

**SOME MANY-POINT PROBLEM FOR AN INHOMOGENEOUS EVOLUTIONARY EQUATION OF FIRST-ORDER IN BANACH SPACE**

*The inhomogeneous evolutionary equation $\frac{dy(t)}{dt} = Ay(t) + f(t)$, where the linear operator $A$ is an infinitesimal generator of a $C_0$ semigroup in a Banach space, is considered. A necessary and sufficient conditions for the existence and uniqueness of a solution for many-point problem is established.*

T. D. Bodnar

**STATISTICAL PROPERTIES OF A TWO DIMENSIONAL OPTIMAL PORTFOLIO**

*We study the estimator for the optimal portfolio weights in a given state of the external environment assuming asset returns to be matrix elliptically contoured distributed. Higher moments of the estimator are obtained in case of a two dimensional portfolio.*

M. I. Dmytryshyn

**THE COMPLETENESS CRITERIONS OF ROOT VECTORS OF REGULAR ELLIPTIC OPERATORS**

*The completeness criterions of root vectors of regular elliptic operators in spaces of $L_p$ $(1 < p < \infty)$ are given. For this purpose we use the known completeness criterions of root vectors of compact operators in Hilbert space and consider one special scale of normed spaces of exponential type vectors of closed operator in Banach space.*

A. V. Zagorodnyuk, Z. G. Novosad

**HYPERCYCLIC OPERATORS OF COMPOSITION ON SPACES OF ANALYTIC FUNCTIONS**

*We construct an example of hypercyclic composition operator on the space of entire functions on $\mathbb{C}^n$ which does not commute with the translation operator.*

I. V. Chernega

**A TRANSLATION OPERATOR IN THE SPACE OF SYMMETRIC ANALYTIC FUNCTIONS ON** $\ell_1$

*We investigate symmetric polynomials on* $\ell_1$*. Using on operator of symmetric translation, we establish some analogues of the Martin formula and the polarization formula for symmetric polynomials and describe some derivatives in the algebra of symmetric polynomials. Some applications to symmetric analytic functions are indicated.*

I. I. Kyrchei

**DETERMINANTAL REPRESENTATION OF THE DRAZIN INVERSE**

*Determinantal representation of the Drazin inverse is obtained by using its limit representation. By applying this determinantal representation of the Drazin inverse, the solution of system of the generalized normal equations is represented by an analogue of Cramer's rule.*

A. O. Lopushansky

**CALCULUS IN CONE OF NEGATIVE TYPE SECTORIAL OPERATORS
AND ANALYTICAL SEMIGROUPS**

*The functional calculation of sectorial operators with negative type in algebra of
analytical functions in the fixed sector of a complex plane is described. Application to
the theory of analytical groups is shown.*

I. E. Chyzhykov

**GENERALIZATION OF THE HARDY–LITTLEWOOD THEOREM**

*For analytic and harmonic functions represented by the generalized Poisson − Stiltjes integral a growth of the $L_p$ -norms in the Stiltjes measure terms are described.*

Z. M. Sheremeta

## PROPERTIES OF THE DERIVATIVES OF AN ENTIRE SOLUTION
## OF A DIFFERENTIAL EQUATION

*Close-to-convexity and $l$-index boundedness of the succesive derivatives of the entire solution $f(z) = -b/\gamma + z + \sum\limits_{n=2}^{\infty} f_n z^n$ of the differential equation $zw'' + \beta w' + \gamma w = 0$ are investigated.*

B. M. Podlevs'kyi

**NUMERICAL ALGORITHM OF THE SOLUTION OF LINEAR
MULTIPARAMETER EIGENVALUE PROBLEMS**

*In the finite-dimensional real Hilbert space of the multiparameter spectral problem is
put in the correspondence the variational problem on a minimum of some functional.
The equivalence of spectral and variational problems is proved. On the basis of gradient
procedure the numerical algorithm of the determination of its eigenvalues and
eigenvectors is offered.*

S. M. Shakhno, O. M. Makukh

**ABOUT ITERATIVE METHODS IN CONDITIONS OF HÖLDER CONTINUITY
OF THE DIVIDED DIFFERENCES OF THE SECOND ORDER**

*Two iterative methods of the Newton type using approximation by the Frechet
derivative of operator of the nonlinear equation by divided differences or their linear
combination are investigated. At the same time local and semilocal convergences of
methods in conditions of Hölder continuity of the divided differences of the second
order are studied. The dependence convergence order of methods from a Hölder constant
is shown. The numerical example is given.*

O. M. Buhriy, O. T. Panat

**SOME PROPERTIES OF THE SOLUTIONS OF A PARABOLIC VARIATIONAL INEQUALITIES WITH VARIABLE EXPONENT OF NONLINEARITY**

*We consider a nonlinear parabolic variational inequality with variable exponent of nonlinearity. Existence, uniqueness and stabilizations properties of the solutions this problem are investigate.*

I. M. Medvid'

**ELLIPTIC VARIATIONAL INEQUALITY IN UNBOUNDED DOMAINS**

*It is proved the existence and uniqueness of a solution for some nonlinear elliptic variational inequality in an unbounded domain without conditions at the infinity. In particular, the growth of the data at the infinity need not to be limited and a solution of the inequality is unique without any restriction of its behavior at the infinity.*

D. V. Portnyagin

**BOUNDEDNESS OF WEAK SOLUTIONS OF NONDIAGONAL SINGULAR
PARABOLIC SYSTEM EQUATIONS**

*The boundedness of weak solutions of a non-diagonal parabolic system of singular
quasi-linear differential equations with matrix of coefficients, satisfying to special
structure conditions, is studied. Thus, the technique, basing on estimating the linear
combinations of unknowns, is employed.*

P. Ya. Pukach

**THE WEIGHT CORRECTNESS CLASSES OF SOLUTION OF MIXED PROBLEM
IN AN UNBOUNDED DOMAIN FOR NONLINEAR HYPERBOLIC SYSTEM**

*The paper is devoted to investigation of the first mixed problem for nonlinear hyperbolic system of the second order in domain unbounded with respect to space variables. Describing system generalizes the system of nonlinear wave equations*

$$u_{tt} - \Delta u + \mid u_t \mid^{p-2} u_t = f(x,t), \quad p > 2,$$ *which is used in elasticity theory. The conditions of the existence and uniqueness of generalized solution have been obtained. The classes of the existence and uniqueness are weight Sobolev spaces of functions with qualitative behavior at infinity.*

E. V. Altukhov

**HOMOGENEOUS SOLUTIONS OF 3D DYNAMIC PROBLEMS OF ISOTROPIC PLATES
WITH BOUNDARY CONDITIONS OF DIAPHRAGM TYPE**

*In article the three-dimensional problem connected thermoelastic oscillations of isotropic plates is considered. Flat sides of plates are covered with a diaphragm and supported at zero temperature or thermoisolated. Homogeneous solutions for the given class of problems of the theory of elasticity are received by I. I. Vorovich method. The solution of a problem is reduced to integration of countable set of the metaharmonic equations.*

O. R. Grycyna, T. S. Nahirnyj

**ON THE INFLUENCE OF ADMIXTURE ON LAYER NORMAL MODE FREQUENCIES**

*On the base of locally gradient binary solid solution model the influence of admixture on layer normal mode frequencies for different boundary conditions on its surface are investigated.*

R. V. Hudz', L. M. Zhuravchak, A. T. Petl'ovanyy

**SOLVING OF THE FLAT STATIC THERMOELASTICITY PROBLEM FOR LOCALLY INHOMOGENEOUS SOLID BY USING BY THE COMBINATION OF BOUNDARY, NEAR-BOUNDARY AND FINITE ELEMENTS METHODS**

*The method of solving the thermoelasticity problem for a solid of complex form with local inhomogeneous domains, where the heat conductivity coefficient and the Lame's coefficients of solid's material depend on the coordinates, is suggested. The solution algorithm is based on the application of operations of additive immersion of operators and on the combination of boundary element technique or near-boundary element technique with Ermite finite elements only in inhomogeneous domains.*

M. A. Sukhorolsky, O. A. Mykytyuk, I. P. Lysyy

**INTERACTION OF THE CYLINDRICAL SHELL WITH THE THIN-WALL SUPPORTS**

*The problem of the interaction of the cylindrical shell and the thin-wall elastic elements with variable thickness is considered in the paper. The law of the variability of the thickness of supports on condition of postulation of the law of contact pressure distribution is found.*

A. K. Rusynko

**ANALYTICAL DESCRIPTION OF UNSTEADY CREEP OF METALS AFTER MECHANICS-THERMAL PROCESSING**

*In paper the generalization of synthesis theory of plastic deformation and creep on a case of the description of creep deformation as functions of previous plastic deformation from the mechanics-thermal processing is presented. The received analytical results concur with experimental data that enables to predict creep properties of a material as function of previous plastic deformation.*