

Abstracts

2010 MSC. 34B15

S. M. Chuiko. **On a reduction of the order in a differential-algebraic system** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 1–17.

The conditions of solvability and the structure of a generalized Green operator of the Cauchy problem for a linear differential-algebraic system are found. The sufficient conditions of reducibility of a differential-algebraic equation to a sequence of systems joining differential and algebraic equations are constructed. An original classification and a single scheme of construction of the solutions of differential-algebraic equations are proposed.

References. 25

2000 MSC. 34E99

V. M. Evtukhov, N. P. Kolun. **Rapidly varying solutions of a second-order differential equation with regularly and rapidly varying nonlinearities** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 18–42.

For a second-order differential equation whose the right-hand side contains the sum of terms with regularly and rapidly varying nonlinearities, we establish the conditions of existence and asymptotic representations of rapidly varying solutions, as the argument tends to a singular point.

References. 19

2010 MSC. 42B99

M. V. Hembars'kyi, S. B. Hembars'ka. **Widths of the classes $B_{p,\theta}^\Omega$ of periodic functions of many variables in the space $B_{1,1}$** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 43–56.

We have obtained the exact-by-order estimates of Kolmogorov, linear, and trigonometric widths of the classes $B_{p,\theta}^\Omega$ of periodic functions of many variables in the space $B_{1,1}$ the norm in which is stronger than the L_1 -norm.

References. 25

2010 MSC. 42A10, 42A27

E. I. Radzievskaya. **On the uniform convergence of Fourier series to (ψ, β) -derivatives** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 57–64.

In terms of the best approximations of a function in the space L_p , the conditions of existence of its (ψ, β) -derivatives and the uniform convergence of Fourier series to them are determined.

References. 5

2010 MSC. 30C65, 30C75

R. R. Salimov. **Logarithmic asymptotics of a class of mappings** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 65–79.

The asymptotic behavior of lower Q -homeomorphisms relative to a p -modulus in \mathbb{R}^n , $n \geq 2$, at a point is studied. A number of logarithmic estimates for the lower limits under various conditions imposed on the function Q are obtained. Some applications of these results to the Orlicz–Sobolev classes $W_{loc}^{1,\varphi}$ in \mathbb{R}^n , $n \geq 3$ under the Calderon-type condition imposed on the function φ and, in particular, to the Sobolev classes $W_{loc}^{1,p}$ for $p > n - 1$ are given. The example of a homeomorphism with finite distortion which shows the exactness of the found order of growth is constructed.

References. 18

2010 MSC. 35B40, 35B45

M. A. Shan. **Keller–Osserman a priori estimates and the removability result for the anisotropic porous medium equation with absorption term** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 80–93.

We obtain the removability result for quasilinear equations of the form

$$u_t - \sum_{i=1}^n (u^{m_i-1} u_{x_i})_{x_i} + f(u) = 0, \quad u \geq 0,$$

and prove a priori estimates of the Keller–Osserman type.

References. 19

2010 MSC. 30C70, 30C75

A. L. Targonskii, I. I. Targonskaya. **Extreme problem for partially nonoverlapping domains on a Riemann sphere** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 94–102.

The results of this work are referred to the well-known trend of the geometric theory of functions of complex variable, namely, to the extreme problems on the classes of nonoverlapping domains. It was started by Lavrent'ev's classical work [1], where, in particular, the problem of the product of conformal radii of two nonoverlapping domains was first solved. Now, this trend is intensively

developed. The main results can be found in [2–8] and [9–13]. Our results present a generalization of some results in [7].

References. 18

2010 MSC. 35A15, 35J35, 35J87, 49J40

M. V. Voitovych. **Improved integrability and boundedness of solutions to some high-order variational problems** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 103–131.

We give a series of results on the improved integrability and boundedness of solutions to several high-order variational problems with strengthened coercivity. In particular, we consider the homogeneous Dirichlet problem on the minimum of integral functionals and study variational inequalities with unilateral and bilateral obstacles and with integral and gradient constraints.

References. 25

2010 MSC. 41A25, 42A35

S. Ya. Yanchenko, S. A. Stasyuk. **Approximative characteristics of functions from the classes $S_{p,\theta}^\Omega B(\mathbb{R}^d)$ with a given majorant of mixed moduli of continuity** // Ukrainian Mathematical Bulletin, **15** (2018), No. 1, 132–148.

We obtain the exact-by-order estimates of the approximation of functions from the classes $S_{p,\theta}^\Omega B(\mathbb{R}^d)$ in the space $L_q(\mathbb{R}^d)$, $1 < p < q < \infty$, by entire functions of the exponential type with supports of their Fourier transforms in sets generated by the level surfaces of a function Ω .

References. 28