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Abstracts

2010 MSC. 32A10, 32A17, 32A37, 30H99, 30A05

A. Bandura, O. Skaskiv. **Some criteria of boundedness of the L-index in direction for slice holomorphic functions of several complex variables** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 154–180.

We investigate the slice holomorphic functions of several complex variables that have a bounded L-index in some direction and are entire on every slice $\{z^0 + t\mathbf{b} : t \in \mathbb{C}\}$ for every $z^0 \in \mathbb{C}^n$ and for a given direction $\mathbf{b} \in \mathbb{C}^n \setminus \{\mathbf{0}\}$. For this class of functions, we prove some criteria of boundedness of the L-index in direction describing a local behavior of the maximum and minimum moduli of a slice holomorphic function and give estimates of the logarithmic derivative and the distribution of zeros. Moreover, we obtain analogs of the known Hayman theorem and logarithmic criteria. They are applicable to the analytic theory of differential equations. We also study the value distribution and prove the existence theorem for those functions. It is shown that the bounded multiplicity of zeros for a slice holomorphic function $F : \mathbb{C}^n \to \mathbb{C}$ is the necessary and sufficient condition for the existence of a positive continuous function $L : \mathbb{C}^n \to \mathbb{R}_+$ such that F has a bounded L-index in direction.

References. 31

2000 MSC. Primary: 30C62, 30C75, 30E10; Secondary: 30F45, 30F60, 32G15

S. L. Krushkal. **Extremal quasiconformality vs bounded rational approximation** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 181–199.

We show that, on most of the hyperbolic simply connected domains, the weighty bounded rational approximation in a natural sup norm is possible only for a very sparse set of holomorphic functions (in contrast to the integral approximation). The obstructions are caused by the features of extremal quasiconformality.

References. 26

2010 MSC. 30G20, 35J70, 35J56, 31A10

S. A. Plaksa. **Schwarz boundary-value problems for solutions of a generalized Cauchy–Riemann system with a singular line** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 200–214.

We consider a generalized Cauchy–Riemann system with a rectilinear singular interval of the real axis. Schwarz boundary value problems for generalized analytic functions which satisfy the mentioned system are reduced to the Fredholm integral equations of the second kind under natural assumptions relating to the boundary of a domain and the given boundary functions.

References. 34

2010 MSC. 30C65, 30L10

E. A. Sevost'yanov, S. A. Skvortsov. **On the local behavior of mappings of metric spaces** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 215–227.

We study the mappings of metric spaces that distort the moduli of the families of paths according to the Poletsky inequality. In the case where the mapped domain is a weakly flat space, and the enveloping metric space admits a weak sphericalization, the equicontinuity of the corresponding families of inverse mappings is established. Under some additional conditions, the equicontinuity of the corresponding families of mappings in the closure of their domain of definition has proved.

References. 15

2010 MSC. 30C70, 30C75

A. L. Targonskii, I. I. Targonskaya, K. Vashenko. **About one extremal problem for open sets and partially non-overlapping domains** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 228–238.

Sharp estimates of a product of the inner radii for pairwise disjoint domains are obtained. In particular, we solve an extremal problem in the case of any finite number of free poles on the rays.

References. 22

R. M. Trigub. **On the Fourier series and transformations** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 239–276.

This survey article is addresses to classical harmonic analysis. In particular, a number of classical theorems are presented with the simplest, in our opinion, proofs (see also [1] and references therein). Some results of the present article are new and are published for the first time.

References. 15

2010 MSC. 35K59, 35B44, 35K58, 35K65

Ye. O. Yevgenieva, A. E. Shishkov. **Method of energy estimates for the study of a behavior of weak solutions of the equation of slow diffusion with singular boundary data** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 277–288.

The equation of slow diffusion with singular boundary data is considered. An estimate of all weak solutions of such a problem is obtained, provided that the boundary regime is localized. The comparative analysis of the results obtained by the method of energy estimates and the barrier technique for the equation of porous medium is presented.

References. 12

2010 MSC. 30C62, 30C65, 30D40, 30F25, 30L10, 31B25, 53D99

V. A. Zorich. **On the boundary behavior of quasiconformal mappings** // Ukrainian Mathematical Bulletin, **16** (2019), No. 2, 289–300.

We discuss some open questions of the theory of quasiconformal mappings adjacent to the field of studies of Professor G. D. Suvorov. The present work is dedicated to his memory.

References. 15