INTERNATIONAL CONFERENCE
"COMPLEX ANALYSIS AND ITS APPLICATIONS"

MSC 30A10,30C75

Comparable functionals of convex domains[1]

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Let G be a convex plane domain. Denote by $\mathbf{P}(G)$ a torsional rigidity of a domain, by $\mathbf{I}_p(G)$ p–order Euclidean moment of G with respect to its boundary, and by $\boldsymbol{\rho}(G)$ the inradius of G, i. e. $\boldsymbol{\rho}(G) := \sup\{\rho(x, G) : x \in G\}$, where $\rho(x, G)$ is the distance function a point x to the boundary ∂G.

Theorem. *Functionals* $\mathbf{P}(G)$ *and* $\mathbf{I}_p(G)\boldsymbol{\rho}(G)^{2-p}$ $(p \geq -1)$ *are comparable quantities in the class of convex domains in a sense of Pólya and Szegö.*

In the report we will show estimates of the exact constants of the ratios of functionals as a function of p. Also we will present generalized inequalities with additional term. We note that in [1] was proved the same assertion in the class of simply connected domains, but only with $p = 2$.

Bibliography

1. Avkhadiev F. G. *Solution of the generalized Saint Venant problem* // Sborn. Math. 1998. V. 189. No. 12. P. 1739–1748.

[1]This work was supported in parts by RFBR (Project 17-01-00282a), and by the subsidy allocated to Kazan Federal University for the state assignment in the sphere of scientific activities (1.9773.2017/8.9).