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The explicit solution of the Neumann boundary value problem for Bauer differential equation in circular domains. (Russian. English summary) Zbl 1476.35106

Izv. Sarat. Univ. (N.S.), Ser. Mat. Mekh. Inform. 21, No. 3, 326-335 (2021).

Summary: The article is devoted to the boundary value problem of Neumann problem's type for solutions of one second-order elliptic differential equation. Based on the general representation of the solutions of the differential equation as two analytical functions of a complex variable, and also taking into account the properties of the Schwarz equations for circles, it is established that in the case of circular domains, the boundary value problem is solved explicitly, i.e., its general solution can be found using only the F. D. Gakhov formulas for solving the scalar Riemann problem for analytic functions of a complex variable, as well as solving a finite number of linear differential equations and (or) systems of linear algebraic equations for which the matrix of the system can be written out in quadratures.

MSC:

35J25 Boundary value problems for second-order elliptic equations

Keywords:

Bauer differential equation; Neumann boundary value problem; explicit solution; circular domain

Full Text: DOI MNR