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CONFORMAL MAPPINGS

The concept of conformal mappings applies to a number of the most important concepts of mathematics. It arose from physical representations and is an important addition to the various fields of physics – the method of conformal mappings help to solve practical problems of hydrodynamics and aerodynamics, the theory of elasticity, the theory of electrostatic, magnetic and thermal fields and others.

Conformal mapping is the transformation of geometric figures, which converts infinitely small figures parts into those of similar shapes. The theory of conformal mappings is closely connected with that of analytic functions of a complex variable. The analytical function being considered as a reflection determines conformal mapping of the function to the area of its values. Conformal mappings are a geometric way of functions of a complex variable, as well as a graph of functions of a real variable is represented by its geometric "portrait".

When studying complex analysis we are confronted to conformal mapping as graphical images of analytic functions. Thus, the theory of conformal mappings is a significant element of mathematical education. It is included in all textbooks and books of the theory of analytic functions [1].

Much attention to the problem of conformal mappings was paid by Jean Le Ron D'alembert, Leonard Euler and Carl Friedrich Gauss. Based on their work, Bernhard Riemann in his dissertation "Foundations of the General theory of functions of a complex variable" (1851) initiated the beginning of geometrical theory of functions and proved (though incorrectly) the main theorem on the possible conformal mappings of arbitrary simply-connected regions. In his research B. Riemann, like L. Euler, used physical representations associated with conformal mappings.

Since the mid-nineteenth century, conformal mappings were widely used as mathematical apparatus for the study of continuum mechanics. N. Zhukovsky and S. Chapligin (hydrodynamics and aerodynamics), G. Kolosov and N. Muskhelishvili (theory of elasticity) contributed to the development of the practical application of the conformal mapping theory [2].

So, conformal mapping is quite a convenient mathematical apparatus for solving of problems of mathematical physics and applied mathematics.

LITERATURE

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