



### THE SOLUTION OF THE PLANE ELASTICITY BASIC PROBLEMS FOR THE UNBOUNDED DOMAINS WITH BOUNDARY CUSPS

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#### Introduction

The solution of the first and the second basic problem of the theory of elasticity [1] for the unbounded domains with boundary cusps was reduced to the solution of the finite linear system when the function which mapped the unit disk exterior on the infinite domain was rational [2-4]. Here the solution for an arbitrary unbounded domain with boundary cusps is reduced to the infinite system.

#### Analysis

The first and second basic problems of the theory of elasticity [1] for the unbounded domain D can be reduced [2-4] to finding two analytic in the domain  $|\zeta| > 1$  functions

$$\Phi(\zeta) = \Gamma - \frac{X + iY}{2\pi(1 + \kappa)z'(\infty)\zeta} + \dots$$

$$\Psi(\zeta) = \Gamma' + \frac{\kappa(X - iY)}{2\pi(1 + \kappa)z'(\infty)\zeta} + \dots$$

using the boundary condition

$$[k\Phi(\zeta)z'(\zeta) + \overline{\Phi(\zeta)}z'(\zeta) - (z(\zeta)\overline{\Phi'(\zeta)} + \overline{\Psi(\zeta)z'(\zeta)})\zeta^{-2}] |_{\zeta=e^{i\theta}} = u(\theta) + iv(\theta), \quad (1)$$