عنوان مقاله:

GENERAL SOLUTION OF ELASTICITY PROBLEMS IN TWO DIMENSIONAL POLAR COORDINATES USING MELLIN TRANSFORM

نویسنده:

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خلاصه مقاله:

Abstract In this work, the Mellin transform method was used to obtain solutions for the stress field components in two dimensional (2D) elasticity problems in terms of plane polar coordinates. the Mellin transformation was applied to the biharmonic stress compatibility equation expressed in terms of the Airy stress potential function, and the boundary value problem transformed to an algebraic problem which was solved to obtain the Mellin transformed Airy stress potential function. The Mellin transform was similarly used to obtain the Mellin transformed stress field components. The use of Mellin transform inversion formula yielded the solutions to the 2D elasticity problem in the physical space domain variables. Specific illustration was considered of the solution by using the Mellin transform method for the Flamant problem and the Mellin transform solutions found to agree with solutions from the literature.

کلمات کلیدی:

Mellin transform method, Mellin transform inversion formula, biharmonic stress compatibility equation, Airy stress potential function, two dimensional (2D) elasticity problem

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