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Numerical Solution of Nonlinear Second-Order Boundary Value Problems Using Vashakmadze's Method with Application to Elastic Beam Bending

In this work, a numerical solution of a nonlinear second-order differential equation, describing the bending of an elastic beam, is presented. The solution is obtained using the method proposed by Professor Tamaz Vashakmadze. The proposed approach is applicable to a broad class of boundary value problems and ensures high accuracy. The results are verified by comparing the numerical solution with an exact analytical solution, demonstrating excellent agreement. The method's flexibility and accuracy suggest its potential for application to other nonlinear problems in mechanics and engineering.

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