

Numerical Solutions of Fourth-Order Fractional Integro-Differential Equations

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In this paper, the homotopy perturbation method (HPM) is developed to obtain numerical solutions of linear and nonlinear boundary value problems for fourth-order fractional integro-differential equations. The fractional derivatives are described in the Caputo sense. Some examples are given and comparisons are made; the comparisons show that the homotopy perturbation method is very effective and convenient and overcome the difficulty of traditional methods. Numerical examples are presented to illustrate the efficiency, simplicity, and reliability of the method.

Key words: Homotopy Perturbation Method; Boundary Value Problems; Integro-Differential Equations; Fractional Derivative; Caputo Sense.