UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

INTEGRAL ITERATIVE METHOD FOR SOLVING KORTEWEG-DE VRIES EQUATIONS

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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TABLE OF CONTENT

ABSTRACT

In this paper, the Integral Iterative Method (IIM) is used to solve the Korteweg-de Vries equation. The Korteweg-de Vries equation (KdV) is a third-order nonlinear partial differential equation. The KdV equation, which describes nonlinear shallow water waves, is widely accepted in physics and engineering. Declaring the solution to the KdV problem is more difficult than with linear differential equations since it involves a nonlinear differential equation with numerous unknowns and significant nonlinearity. A notable drawback of the Adomian decomposition strategy, which is another method for solving nonlinear equations, is that it calls for the usage of higher-order differential derivatives. The main objective of this report is to analyse the accuracy and efficiency of the Korteweg-de Vries equation solution with its exact solutions. Four Korteweg-de Vries equation cases have been chosen. The equation is then implemented with IIM. The problem was analysed and solved using the Integral Iterative Method on the Korteweg-de Vries equation. The error is calculated based on the results. The results indicate that IIM is accurate, convenient, and efficient when it comes to solving nonlinear problems. As a recommendation, other researchers can use the example for non-homogeneous KdV equations with initial conditions.