

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**SOLVING THE RICCATI DIFFERENTIAL EQUATION
BY USING RUNGE-KUTTA METHOD AND THE
COMBINATION OF NEWTON'S INTERPOLATION
AND AITKEN'S METHOD**

P26S22

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

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ABSTRACT

In mathematics, the first-order ordinary differential equation that is quadratic in the unknown function is referred to as a Riccati equation. The problem that we want to solve in this study is to find the exact solution of Riccati differential equation and to know the effective method to solve the Riccati differential equation. There are multiple approaches for solving various types of Riccati equations. Here we study and solve the Riccati differential equation by first finding the exact solution. Then we will analyze the numerical solution of the Riccati differential equation by using Runge Kutta Method and the combination of Newton's Interpolation and Aitken's Method. Lastly, we will decide the effective method between Runge-Kutta Method and the combination of Newton's Interpolation and Aitken's Method by comparing their absolute errors. Generally, three examples of Riccati equations are taken to solve by using the proposed method. The results showed a different approach of step size and chosen method for every example.