

The Applications of Non-polynomial Spline to the Numerical Solution for the Fractional
Differential equations

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This paper presents a new computation and task on non-polynomial spline of fractional order to solve the fractional differential equations by Caputo fractional derivative. The usual Taylor series is used to discretize the time derivative of the function. Several examine problems are present to confirm the accuracy of the spline method and to show the completion of Non-polynomial spline. In addition, we show the numerical computations provided and can be used to solve difficult problems, also the results are found to be in good error estimations with known exact solutions.

Keywords: Spline approximation; fractional derivative; Convergence analysis; error bound.

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