COMPARISON OF HIGHER ORDER ITERATIVE METHODS IN SOLVING NONLINEAR EQUATIONS

MUHAMMAD SYAFIQ BIN SALLEH

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Universiti Teknologi Mara

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ABSTRACT

This study explores the effectiveness of five higher-order iterative techniques for solving nonlinear equations which are Newton method, Jarratt method, Frontini and Sormani method, Potra and Ptak method, and Weerakoon and Fernando method. All of these methods are the early improvement of the Newton method. All these methods will be compared and test with eight different type of test functions and also with differences tolerance. The comparison of the methods is assessed according on the amount of CPU time used, the accuracy of the outcomes, and the number of iterations needed. According to the investigation, the Newton method approach is the most CPU-time efficient because of its simplicity, but the Jarratt method performs better with less repetitions because of its greater convergence rate. Most of the methods have similar accuracy, however the Potra and Ptak method exhibits more frequent convergence failures. This study emphasizes how important it is to balance iteration count and computational efficiency when choosing suitable iterative algorithms based on particular computational requirements.

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