

An Optimal and Efficient Family of Fourth-Order Methods for Nonlinear Equations

Authors : Parshanth Maroju, Ramandeep Behl, Sandile S. Motsa

Abstract : In this study, we proposed a simple and interesting family of fourth-order multi-point methods without memory for obtaining simple roots. This family requires only three functional evaluations (viz. two of functions $f(x_n)$, $f(y_n)$ and third one of its first-order derivative $f'(x_n)$) per iteration. Moreover, the accuracy and validity of new schemes is tested by a number of numerical examples are also proposed to illustrate their accuracy by comparing them with the new existing optimal fourth-order methods available in the literature. It is found that they are very useful in high precision computations. Further, the dynamic study of these methods also supports the theoretical aspect.

Keywords : basins of attraction, nonlinear equations, simple roots, Newton's method

Conference Title : ICAMNA 2016 : International Conference on Applied Mathematics and Numerical Analysis

Conference Location : Cape Town, South Africa

Conference Dates : November 03-04, 2016