

Sixth-Order Two-Point Efficient Family of Super-Halley Type Methods

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Abstract : The main focus of this manuscript is to provide a highly efficient two-point sixth-order family of super-Halley type methods that do not require any second-order derivative evaluation for obtaining simple roots of nonlinear equations, numerically. Each member of the proposed family requires two evaluations of the given function and two evaluations of the first-order derivative per iteration. By using Mathematica-9 with its high precision compatibility, a variety of concrete numerical experiments and relevant results are extensively treated to confirm the theoretical development. From their basins of attraction, it has been observed that the proposed methods have better stability and robustness as compared to the other sixth-order methods available in the literature.

Keywords : basins of attraction, nonlinear equations, simple roots, super-Halley

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