

APPROXIMATION OF ZEROS OF NONLINEAR REAL FUNCTIONS USING A VARIANT OF THE FALSE POSITION METHOD BASED ON QUADRATIC POLYNOMIALS

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We present a quadratic variant of the classical False Position Method (VQFPM) for approximating the zeros of nonlinear real functions. The method is based on second-degree Lagrange interpolation using three dynamic points within each iteration interval, which significantly improves the convergence rate without requiring derivatives. We establish the theoretical foundations of the method and derive rigorous bounds for its convergence error. Through numerical experiments implemented in the open-source software Maxima, we demonstrate that VQFPM achieves high precision with fewer iterations than traditional methods, including Newton and Secant. These results highlight VQFPM as a robust and efficient alternative for derivative-free root finding.

1. Introduction

The classical false position method, despite its simplicity and robustness, often exhibits slow convergence when applied to certain classes of nonlinear real functions. This limitation has motivated the development of modified algorithms that enhance convergence without significantly increasing computational complexity. In this context, we introduce a new variant of the method—the **Variant of**

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