

## **Semilocal Convergence of a Three Step Fifth Order Iterative Method under Hölder Continuity Condition in Banach Spaces**

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**Abstract :** In this paper, we study the semilocal convergence of a fifth order iterative method using recurrence relation under the assumption that first order Fréchet derivative satisfies the Hölder condition. Also, we calculate the R-order of convergence and provide some a priori error bounds. Based on this, we give existence and uniqueness region of the solution for a nonlinear Hammerstein integral equation of the second kind.

**Keywords :** Holder continuity condition, Frechet derivative, fifth order convergence, recurrence relations

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