Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Issue 1, June 2001, pp. 22–28.
Submitted: January 3, 2001. Published: June 30, 2001.

LOCAL AND SEMILOCAL CONVERGENCE THEOREMS FOR NEWTON'S METHOD BASED ON CONTINUOUSLY FRÉCHET DIFFERENTIABLE OPERATORS

Ioannis K. Argyros

Abstract. We approximate locally unique solutions of nonlinear equations in a Banach space setting using Newton's method. In contrast with earlier works which are based on the Lipschitz continuity of the operators involved, we only use the continuity of the first Fréchet derivative of the operator involved. Local and semilocal convergence theorems are given and the quadratic convergence of Newton's method under weaker than before conditions is established.

A.M.S. (MOS) Subject Classification Codes:. 65H10, 47H15, 49M17.

Key Words and Phrases:. Banach space, Newton's method, Fréchet-derivative, order of convergence, local-semilocal convergence.

Department of Mathematics, Cameron University, Lawton, OK 73505, U.S.A.
E-mail Address: ioannisa@cameron.edu
©2001 Cameron University

Typeset by $\mathcal{AMS}$-TEX