

ON A GENERALIZATION OF NEWTON-KANTOROVITCH METHOD

A b s t r a c t

It is considered the iterative method (2), where $P : \Omega \rightarrow Y$ is a non-linear operator, X, Y , are Banach spaces, Ω is an open subset of X , $M : \Omega_0 \rightarrow L(Y, X)$, Ω_0 is the closing of an open subset of Ω , $L(Y, X)$ is the space of linear bounded operators which transforms Y into X and $\{\lambda_n\}$ is a real numbers sequence

$$0 < \lambda_n \leq 1, \lambda_0 \geq \lambda_1 \geq \lambda_2 \geq \dots, \text{ in } \Gamma \lambda_n = \lambda \geq 0.$$

If $\lambda_n = 1, n = 0, 1, 2, \dots$, (2) gives the Newton-Like methods which was considered in [2] and [1].

If $\lambda_n = 1, n = 0, 1, 2, \dots$ and $M(x_n) = [P'(x_n)]^{-1}$ is the inverse of the derivative in Fréchet's sense of $P(x)$, (2) gives the well known Newton-Kantorovitch's method which was considered in [3], [4].

The paper gives the sufficient conditions for the convergence of the method (2) towards the solution of the equation (1).