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THE EXISTENCE, UNIQUENESS AND APPROXIMATION METHODS FOR FIXED POINTS OF ϕ- PSEUDOCONTRACTIVE OPERATOR IN BANACH SPACES

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Abstract

The purpose of this paper is to introduce Φ-pseudocontractive and Φ-accretive operators and to study the existence, uniqueness and approximation methods for the fixed points and the solutions of equations deal with these operators. Let X be an arbitrary real Banach space and $T : X \to X$ a Φ-pseudocontractive operator. It is shown that T has an unique fixed point if T is continuous or X is uniformly smooth and T is demicontinuous. And the Ishikawa iterative sequence with errors $\{X_n\}$ converges strongly to the fixed point if T is strengthened to uniformly continuous. But, if X is uniformly smooth then any continuity of T is unnecessary for the convergence of $\{x_n\}$. By using these results, the existence and uniqueness of solution of nonlinear equations with Φ-accretive operator and the iterative approximation method are obtained.

Key Words and Phrases : Φ-*accretive operator,* Φ-*pseudocontractive operator, Demicontinuous, Ishikawa iteration sequence.*

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