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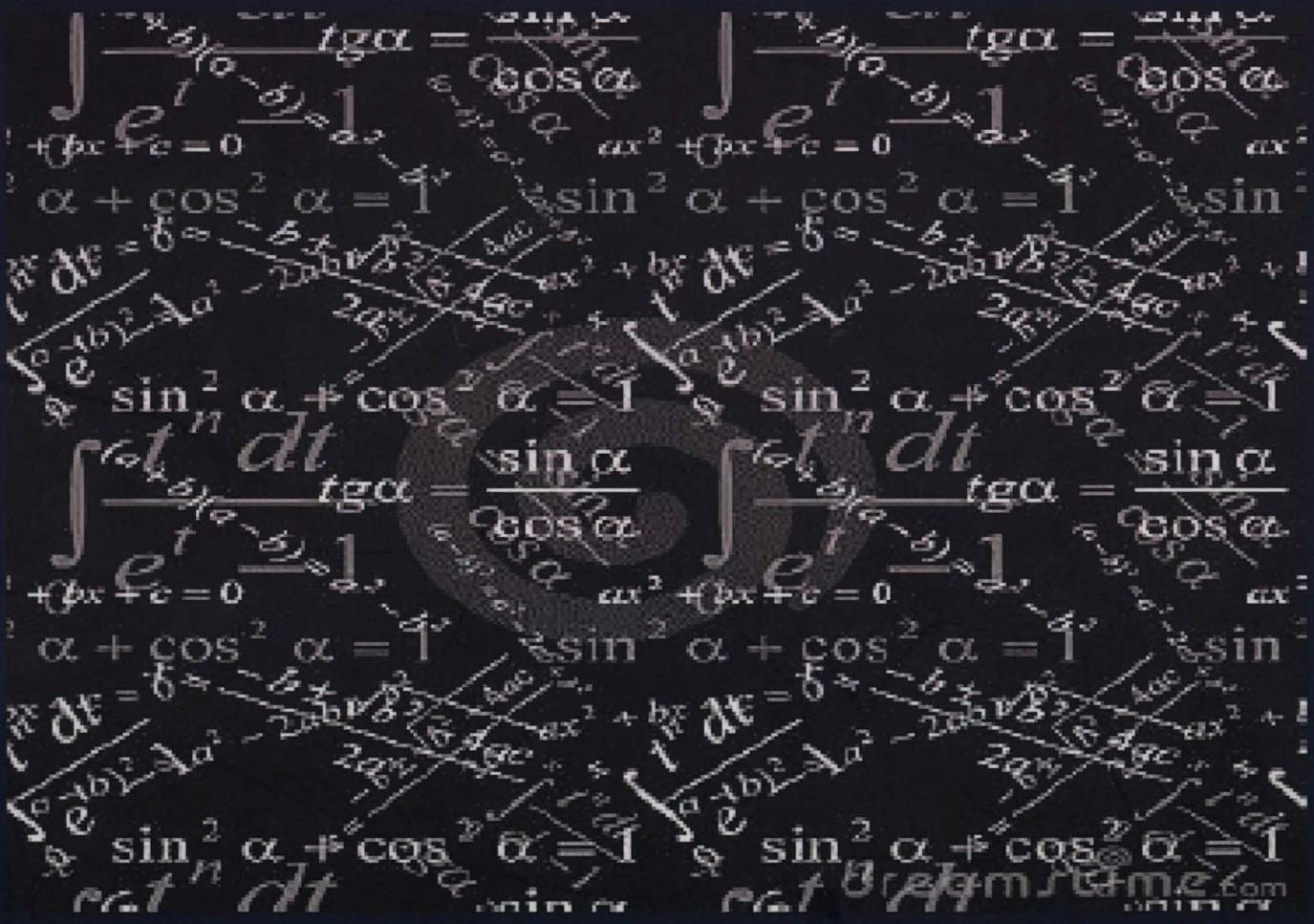

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ON UNIFICATION OF THE STRONG CONVERGENCE THEOREMS FOR A FINITE FAMILY OF TAN MAPPINGS IN BANACH SPACES

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Abstract

In this paper, we unify all know iterative methods by introducing a new explicit iterative scheme for approximation of common fixed points of finite families of total asymptotically I-nonexpansive mappings. We prove the strong convergence theorems for such iterative process to a common fixed point of the finite family of total asymptotically $I-$nonexpansive and total asymptotically nonexpansive mappings, defined on a nonempty closed convex subset of uniformly convex Banach spaces.

Keywords: *Explicit iteration process; a total asymptotically $I-$nonexpansive mapping; a total asymptotically nonexpansive mapping; common fixed point.*

Introduction

Let K be a nonempty subset of a real normed linear space X and $T: K \to K$ be a mapping. Denote by $F(T)$ the set of fixed points of T, that is, $F(T) = \{x \in K : Tx = x\}$. Throughout this paper, we always assume that X is a real Banach space and $F(T) \neq \varnothing$. Now let us recall some known definitions

Definition 1. A mapping $T: K \to K$ is said to be:

(i) nonexpansive, if $\| Tx - Ty \| \leq \| x - y \|$ for all $x, y \in K$;

(ii) asymptotically nonexpansive, if there exists a sequence $\{\lambda_n\} \subset [1, \infty)$ with $\lim_{n\to\infty} \lambda_n = 1$ such that $\| T^n x - T^n y \| \leq \lambda_n \| x - y \|$ for all $x, y \in K$ and $n \in N$;

In [1]-[2] Browder studied the iterative construction for fixed points of nonexpansive mappings on closed and convex subsets of a Hilbert space. Note that for the past 30 years or so, the study of the iterative processes for the approximation of fixed points of nonexpansive mappings and fixed points of some of their generalizations have been flourishing areas of research for many mathematicians (see for more details [3],[4]).

The class of asymptotically nonexpansive mappings was introduced by Goebel and Kirk [5] as a generalization of the class of nonexpansive mappings. They