

Reich, Simeon; Zaslavski, Alexander J.

A fixed point theorem for Matkowski contractions. (English) Zbl 1151.47054
Fixed Point Theory 8, No. 2, 303-307 (2007).

In this short note, the authors prove a fixed point theorem for a Matkowski contraction. They prove that, if K is a nonempty closed subset of a complete metric space (X, ρ) and $T : K \rightarrow X$ satisfies $\rho(Tx, Ty) \leq \phi(\rho(x, y))$ for all $x, y \in K$, where $\phi : [0, \infty) \rightarrow [0, \infty)$ is increasing and satisfies $\lim_{n \rightarrow \infty} \phi^n(t) = 0$ for all $t > 0$ and, finally, if there is a nonempty bounded subset $K_0 \subset K$ such that for each natural number n , there exists $x_n \in K_0$ such that $T^n x_n$ is defined, then T has a unique fixed point in K . With this result, the authors successfully extend the known Banach fixed point theorem to a non-self mapping.

Reviewer: [Pratulananda Das \(Kolkata\)](#)

MSC:

[47H10](#) Fixed-point theorems

[47H09](#) Contraction-type mappings, nonexpansive mappings, A -proper mappings, etc.

[54H25](#) Fixed-point and coincidence theorems (topological aspects)

[54E50](#) Complete metric spaces

Cited in **1** Review
Cited in **13** Documents

Keywords:

[contraction](#); [Matkowski contraction](#); [complete metric space](#); [fixed point](#); [iteration](#)