

Czerwik, S.

Contraction mappings in b -metric spaces. (English) Zbl 0849.54036
Acta Math. Inform. Univ. Ostrav. 1, 5-11 (1993).

Introducing the concept of a bimetric space a few fixed point theorems have been proved. Let X be a nonempty set and \mathbb{R}_+ the set of all nonnegative numbers. Then $d : X \times X \rightarrow \mathbb{R}_+$ is a b -metric iff for all $x, y, z \in X$ and all $r > 0$ the following conditions are satisfied: $d(x, y) = 0 \iff x = y$; $d(x, y) = d(y, x)$; $d(x, y) < r$ and $d(x, z) < r$ imply $d(y, z) < 2r$. The pair (X, d) is a b -metric space.

The following result is included as a sample. Let (X, d) be a complete b -metric space and $T : X \rightarrow X$ satisfy $d(T(x), T(y)) \leq Q(d(x, y))$, $x, y \in X$, where $Q : \mathbb{R}_+ \rightarrow \mathbb{R}_+$ is an increasing function such that $\lim_{n \rightarrow \infty} Q^n(t) = 0$ for each fixed $t > 0$. then T has a unique fixed point u and $\lim_{n \rightarrow \infty} d(T^n(x), u) = 0$ for each $x \in X$.

Reviewer: [S.P.Singh \(St.John's\)](#)

MSC:

54H25 Fixed-point and coincidence theorems (topological aspects)
47H10 Fixed-point theorems

Cited in **9** Reviews
Cited in **285** Documents

Keywords:

[bimetric space](#); [b-metric space](#)

Full Text: [EuDML](#)

References:

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