



Periodic point for the generalized (ψ, ϕ) -contractive mapping in right complete generalized quasimetric spaces

Negar Gholami

Shiraz University of Technology

Mohammad Javad Mehdipour*

Shiraz University of Technology

Abstract

In this paper, we introduce concept of generalized (ψ, ϕ) -contractive mappings of type I and II for generalized quasimetric spaces. We show that if f is a (ψ, ϕ) -contractive map of type I or II, then f has a periodic point.

Keywords: Contractive mapping, generalized quasimetric spaces, periodic point.

Mathematics Subject Classification [2010]: 47H10, 47H09

1 Introduction

The concept of metric space represented in 1906 by Frechet [4]. The metric space and its generalizations are important in many branches of mathematics, particular fixed point theory. This theory is one of the old theory in mathematics that it has wide range of applications. Banach contraction principle creates simple and suitable conditions to guarantee existence and uniqueness of solution of operator equation $Tx = x$. This principle is the most essential theorem of classical functional analysis. Over the past few decades, with the change in contraction's condition or change in the definition of the metric space and or both, the generalization of this theorem is obtained [1, 5]. For example, Branciari [1] has introduced the concept of generalized metric by replacing the triangle inequality to overall inequality is called a quadrilateral inequality. Branciari proved the fixed point theorem in this space and claimed that a generalized metric is a continuous function, generalized metric space is Hausdorff and any convergent sequence is Cauchy sequence in generalized metric space. Sarma and et al. [8] and Samet [7] provide an example showed that some features claimed by Branciari are not true, especially Hausdorffness. Note that in the proof of uniqueness of the fixed point, the condition is necessary Hausdorff space. Despite the weakness in generalized metric space, several authors have been proposed some of techniques to obtain a unique fixed point [2, 3].

Recently, quasimetric space have been one of interesting issues for the researchers in the field of fixed point theory, because the assumption of quasimetric are weaker than the standard metric, thus fixed point results obtained in this space is very public. So it also covers the corresponding results in the metric space. Very recently Lin and et al. [6] introduced the concept of generalized quasimetric space and examine the existence of determined operator on such space.

*Speaker