

A FIXED POINT THEOREM FOR THREE MAPPINGS

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Abstract: In this paper two fixed point theorems for three mappings have been proved.

Keywords and Phrases: Self maps, common fixed point, complete metric space.

1. Introduction

A well known Banach contraction principle states that a contraction mappings on a complete metric space has a unique fixed point. Jaggi and Das [1] in 1980 gave an extension of Banach fixed point theorem through a rational expressions. This result was generalized by Murthy and Sharma [2] in 1991. In this paper, we prove two fixed point theorems for three self mappings.

2. Main Results

We establish the following theorems:

Theorem 1. Let E, F and T be the three self maps of a complete metric space (X, d) satisfying the following conditions:

- (a) (E, T) and (F, T) are commuting pairs.
- (b) $EX \subset TX, FX \subset TX$.
- (c) There exist integers $r, s > 0$ such that

$$d(E^r x, F^s y) \leq \frac{K \cdot d(Tx, E^r x) \cdot d(Ty, F^s y)}{d(Ty, F^s y) + d(Ty, E^r x)}$$

for every $x, y \in X$ and $0 < K < 1$.

Then E, F and T have a unique common fixed point in X , provided T is continuous.