Chandok, Sumit; Narang, T. D.
Common fixed points and invariant approximation for Gregus type contraction mappings. (English) Zbl 1237.41012


Theorem. Let $T, I : K \to K$ be two weakly commuting mappings on a closed convex subset $K$ of a Banach space $X$ satisfying

$$||Tx - Ty|| \leq a||Ix - Iy|| + (1 - a) \max\{||Ix - Tx||, ||Iy - Ty||\}$$

for all $x, y \in K$, where $0 < a < 1$. If $I$ is linear, nonexpansive on $K$ such that $T(K) \subseteq I(K)$, then $T$ and $I$ have a unique common fixed point in $K$.

The purpose of this paper is to prove similar results when the underlying space is a convex metric space. The method used is the same that was used by Gregus in his paper cited above. As applications, the authors obtain common fixed points and invariant approximation results for compatible and $C_q$-commuting mappings.

Reviewer: Richard A. Zalik (Auburn)

MSC:
41A50 Best approximation, Chebyshev systems
47H10 Fixed-point theorems
54H25 Fixed-point and coincidence theorems (topological aspects)

Keywords:
$C_q$-commuting; convex metric space; starshaped set; commuting; compatible maps

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References:

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