

STUDY OF ENRICHED RATIONAL CONTRACTIONS IN CONVEX METRIC SPACE

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Abstract: This paper introduces and investigates two classes of enriched contraction mappings, namely enriched Jaggi contractions and enriched Dass and Gupta contractions, in the framework of convex metric spaces. For a continuous self-mapping on a complete convex metric space, fixed point theorems are established for both classes, proving the existence and uniqueness of a fixed point. In addition, a Krasnoselskij iterative method is employed to approximate the fixed point, and the corresponding iterative sequence is shown to converge to the unique fixed point for every initial point. Furthermore, the introduced enriched Jaggi and enriched Dass and Gupta contractions are extended to convex G -metric space, where analogous existence, uniqueness, and convergence results are established. The relationship of the obtained results with several well-known contraction mappings, including Banach, Jaggi and Dass and Gupta contractions, is demonstrated through suitable corollaries. Finally, an example is presented to illustrate the applicability of the proposed enriched contractions and the convergence of the associated iterative process.

Keywords and Phrases: Enriched Contraction, Convex Metric, G -metric space, Complete metric space, Krasnoselskij iteration.

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