CONVERGENCE AND STABILITY OF A NEW THREE-STEP ITERATIVE TECHNIQUE IN CONVEX METRIC SPACE

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Abstract: In order to approximate the fixed points of a contractive mapping, a new three-step iteration approach is proposed in this study. Additionally, the suggested scheme's stability and convergence are taken into account, and its efficacy for various problems is explored. The novel technique outperforms all the well-known three-step strategies that are currently accessible in the literature, according to several experiments that are described.

Keywords and Phrases: Contraction mapping, Stability, Fixed point, Convex metric, Convergence.

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1. Introduction

Fixed point (FP) problems may be used to create a wide range of mathematical issues, including systems of nonlinear equations, integral and differential equations, systems of linear equations, variational analysis problems and optimization theory problems. The reader is directed to ([5], [4], [3], [18]) for the latest recent work on FP issues and related problems. The approximate solution to these issues and the conditions under which they can be solved are investigated using FP theory. The FP of any given nonlinear function cannot be found using any universal closed-form formula. For this reason, FP iterative algorithms offer a sophisticated and effective method of computing them.