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A STUDY OF FIXED POINT THEOREMS IN METRIC SPACES

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ABSTRACT

Many issues in mathematical analysis can be solved by applying fixed point theorems to metric spaces. Nonlinear analysis, in which fixed point theory plays a central role, is one of the most important branches of modern mathematics. The presence of a solution for a broad variety of mathematical problems is analogous to the existence of a fixed point for an appropriate map. Therefore, the fact that fixed exists is of paramount relevance in many branches of mathematics and the sciences. The requirement that maps have a solution is given by the fixed point result. The theory itself is a stunning synthesis of topology, geometry, and (pure and applied) analysis. In the past half-century or more, the theory of fixed point (F.P.) has been recognized as a crucial resource for understanding non-linear processes. Numerous mathematical fields make use of F.P. theorems. In particular, this method has been used in a wide variety of fields throughout the mathematical sciences, including biology, chemistry, economics, engineering, optimization and game theory, physics, dynamic programming, system analysis, communication network space, etc.