

J. of Ramanujan Society of Mathematics and Mathematical Sciences
Vol. 11, No. 1 (2023), pp. 115-126

DOI: 10.56827/JRSMMS.2023.1101.8

ISSN (Online): 2582-5461

ISSN (Print): 2319-1023

AN APPROACH TO THE STUDY OF FIXED POINT THEORY IN HILBERT SPACE

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(**Received:** Nov. 06, 2023 **Accepted:** Dec. 29, 2023 **Published:** Dec. 30, 2023)

Abstract: The purpose of this article is to extend Banach's contraction principle through a new rational expression in the contractive condition to establish the existence and uniqueness of fixed point of a closed subset of Hilbert space to a self mapping. The result is extended to a pair of self mappings and positive integers powers of a pair mapping and further extended to a sequence of mappings in the space. The presented results extend and generalized various known comparable results from the current literature.

Keywords and Phrases: Fixed point, Common fixed point, Hilbert space, Closed subset.

2020 Mathematics Subject Classification: 47H10, 54H25.

1. Introduction

The most celebrated contraction mapping principle, formulated and proved in the Ph.D. dissertation of Banach [1] in 1920, which was published in 1922, is one of the most important theorems in classical functional analysis. This contraction mapping principle has been generalized in various directions. One of the most