

An existence result for implicit functional equations

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Abstract

In this article, we attempt to provide a more general method based on Petryshyn's fixed point theorem to ensure the existence of solutions to implicit functional equations. These implicit functional equations include fractional, non-fractional, (fractional) stochastic integral equations, etc., and any combination of them in $C(I)$. Some results regarding the existence of fixed point in implicit functional integral equations will be reviewed in the literature. We show that this general result unifies and improves many main results in the literature. To illustrate that our approach is more general than other methods, we present some concrete examples. Also, we apply our method to create new functional equation in practice and check the existence of solution.

MSC: 31B10, 47H10, 47H08, 60H20.

Keywords and phrases: fixed point theorem, (fractional) integral equations, (fractional) stochastic integral equations, measures of noncompactness

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