

Introduction

Fixed point theorems play a fundamental role in nonlinear analysis and have profound applications in the study of partial differential equations (PDEs) and Ordinary differential equations. These theorems, which guarantee the existence of points that remain invariant under certain mappings, provide powerful tools for proving the existence and uniqueness of solutions to various classes of PDEs. Classical results such as Banach's Fixed Point Theorem, Brouwer's Fixed Point Theorem, and Schauder's Fixed Point Theorem allow analysts to reformulate complex PDE problems into fixed point problems. Using these foundational theorems, one can systematically approach nonlinear equations in both finite- and infinite-dimensional spaces. In this talk, we will discuss an application of Schauder's fixed point Theorem and study the existence of a weak solution of the certain class of function for the Dirichlet boundary value problem.