Rearrangement on Conditionally Convergent Integrals in Analogy to Series

Edward J Timko
University of Dayton
Dayton OH 45469-2316
Email: timkoedz@notes.udayton.edu

Abstract

Rearrangements on conditionally convergent series suggest the existence of a similar process for integrals, here also referred to as rearrangement. In this document, a general theorem concerning rearrangement for conditionally convergent integrals is presented, as well as supporting theorems and a corollary to the general theorem. The corollary reads: Let \( f : \mathbb{R}^+ \to \mathbb{R}^+ \) be a continuous function with an everywhere negative and monotone increasing derivative. If \( \int_{1}^{\infty} (-1)^{x} f(x) \, dx \) is conditionally convergent, then \( \forall z \in \mathbb{C} \), there exists an arrangement on \( \int_{1}^{\infty} (-1)^{x} f(x) \, dx \) such that \( z = \int_{1}^{\infty} (-1)^{x} f(x) \, dx \).