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8. Analysis

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Convergence theorem for Henstock - Kurzweil integral based on the convergence of primitives

We introduce certain compact subsets Q of the space $\mathbb{C}$ of continuous functions, the elements of Q being primitives of functions integrable in the sense of Henstock-Kurzweil. The sets Q are described by a condition analogous to the Saks-Henstock lemma (up to sets of zero measure) and a condition of "variation zero". Main result: If F is the limit in $\mathbb{C}$ of $F_j \in Q, j = 1, 2, \ldots$, then $F \in Q$ and, moreover, f_j converge in measure to f provided F_j, F are the primitives of f_j, f. The relation of the convergence to (locally convex) topologies is studied.

Reference: J. Kurzweil and J. Jarník, A convergence theorem for Henstock-Kurzweil integral and its relation to topology, Bull. Acad. Royale de Belgique, Cl. de Sciences, to appear