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BANACH ALGEBRAS OF FUNCTIONS HAVING GENERALIZED BOUNDED VARIATION

Throughout f will be a real valued function defined on a closed interval [a, b]. Extensive use will be made of partitions or subdivisions $x_0, x_1, \ldots, x_n$ of [a, b] for which $a \leq x_0 < x_1 < \ldots < x_n \leq b$. Such subdivisions will be referred to as π-subdivisions.

In 1881, Camille Jordan introduced his well known concept of bounded variation. The total variation of f on [a, b] is defined as

$$V_1(f; a, b) = \sup_{\pi} \sum_{i=1}^{n} |f(x_i) - f(x_{i-1})|.$$

If $V_1(f; a, b) < \infty$, f is said to be of bounded variation on [a, b], written $f \in BV[a, b]$ or $f \in BV_1[a, b]$.

Many extensions and generalizations of Jordan's variation have been given subsequently. The particular generalization to be discussed here arises from the following result: