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LATTICES, ALGEBRAS AND BAIRE'S SYSTEMS GENERATED BY SOME FAMILIES OF FUNCTIONS

I. Preliminaries. Let us establish some of the terminology to be used. R denotes the real line. Let (X,T) be a topological space. A function $f:X \to R$ is said to be T-quasi-continuous at a point $x_0 \in X$ iff for every $\varepsilon > 0$ and for any neighbourhood $U \in T$ of the point x_0 there exists a T-open set V such that $0 \neq V \subset U$ and $|f(x) - f(x_0)| < \varepsilon$ for every $x \in V$, T-cliquish at $x_0 \in X$ iff for every $\varepsilon > 0$ and for any neighbourhood $U \in T$ of the point x_0 there exists a T-open set V such that $0 \neq V \subset U$ and $|f(x) - f(x_1)| < \varepsilon$ for $x, x_1 \in V$.

A function $f:X \to R$ is T-quasi-continuous (T-cliquish) on X iff f is T-quasi-continuous (T-cliquish) at every point of X.

Let $X = R^m$. We shall use the following differentiation basis. For every $k \in N$ (N denotes the set of all positive integers) let P_k be the family of all m-dimensional intervals of the form

$$\langle i_1-1/2^k, i_1/2^k) \times \ldots \times \langle i_m-1/2^k, i_m/2^k)$$

where $i_1, i_2, \ldots, i_m = 0, \pm 1, \pm 2, \ldots$.