LOOKING FOR DIFFERENCES

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We consider the following families of real-valued functions: Darboux ($\mathcal{D}$), quasi-continuous ($\mathcal{Q}$) and Świątkowski functions ($\acute{\mathcal{S}}$).

Definition. Let $f \colon \mathbb{R} \to \mathbb{R}$

- $f \in \mathcal{Q}$ if for all $a < x < b$ and each $\varepsilon > 0$ there exists an open interval $J \subset (a, b)$ such that $\operatorname{diam} f[J \cup \{x\}] < \varepsilon$;
- $f \in \acute{\mathcal{S}}$ if for all $a < b$ with $f(a) \neq f(b)$, there is a y between $f(a)$ and $f(b)$ and an $x \in (a, b) \cap \mathcal{C}(f)$ such that $f(x) = y$.

We are going to compare classes $\acute{\mathcal{S}}\mathcal{Q} \setminus \mathcal{D}$ and $\acute{\mathcal{S}} \setminus (\mathcal{D} \cup \mathcal{Q})$ in terms of their algebrability.

Definition. Let κ be a cardinal number, $\mathcal{L}$ be a commutative algebra and a set $A \subset \mathcal{L}$. We say that A is

- κ-algebrable if $A \cup \{\theta\}$ contains a κ-generated algebra;
- strongly κ-algebrable if $A \cup \{\theta\}$ contains a κ-generated algebra that is isomorphic to a free algebra.

The goal of this talk is to show the difference between algebrability of considered classes (which are on the first sight very similar). We are going present the following theorems.

Theorem. *Family $\acute{\mathcal{S}}\mathcal{Q} \setminus \mathcal{D}$ is $\mathfrak{c}$-algebrable.*

Theorem. *Family $\acute{\mathcal{S}} \setminus (\mathcal{Q} \cup \mathcal{D})$ is no 1-algebrable.*

References

[1] J. Wódka *Subsets of some families of real functions and their algebrability*, unpublished.

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