EGGLESTON THEOREM AND ITS GENERALIZATIONS

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Our main motivation is the following result.

Theorem 1 (Eggleston [1])**.** *Let $A \subseteq \mathbb{R}^2$ be a Borel set of positive Lebesgue measure. Then there are two perfect sets $B, P \subseteq \mathbb{R}$ such that $B \times P \subseteq A$ and B has positive measure.*

We will consider variants and generalizations of this result. In particular, we will cosider various ideals on the plane of the form $\mathcal{I} \otimes \mathcal{J}$, i.e. Fubini product of $\mathcal{I}$ and $\mathcal{J}$.

Presented results are connected to [3] and [2].

References

[1] H. G. Eggleston, Two measure properties of Cartesian product sets, The Quarterly Journal of Mathematics 5 (1954), 108–115,

[2] M. Michalski, R. Rałowski, Sz. Żeberski, Mycielski among trees, `https://arxiv.org/abs/1905.09069`,

[3] Sz. Żeberski, Nonstandard proofs of Eggleston like theorems, Proceedings of the Ninth Topological Symposium (2001), 353–357.

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