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PROBLÈMES

P 1082, R 1. The answer is negative. J. Arias de Reyna proved that every universally measurable maximal ideal in the space $H(C)$ of entire functions on the complex plane is closed. Here is the author's proof. Let J be a dense maximal ideal in $H(C)$ and $g \in J \setminus \{0\}$. Since J is dense, g has an infinite number of zeros. By the Weierstrass theorem, $g(z) = \prod_{n \geq 0} P_n(z)$, where $P_n(z)$ is, for every $n < \omega$, an entire function with a unique zero, and for every $A \subset \omega$, the product $\prod_{n \in A} P_n(z)$ converges uniformly on the compact sets of C.

We define $\pi \colon 2^{\omega} \to H(C)$ by $\pi(x) = \prod_{x(n)=1} P_n(z)$. It is clear that π is a continuous map.

Since J is a dense maximal ideal, it follows from Henriksen's theorem (see, e.g., N. Bourbaki, *Algèbre Commutative*, Chap. 5, § 1, Ex. 12) that the class of the zero-sets $Z(f)$ of elements f in J is a ultrafilter basis on C. This implies that $\pi^{-1}(J)$ is the set of the characteristic functions of the sets of a non-trivial ultrafilter on ω.

If J is universally measurable, $\pi^{-1}(J)$ is also universally measurable. By Sierpiński theorem (cf. W. Sierpiński, *Fonctions additives non complètement additives et fonctions nonmesurables*, Fundamenta Mathematicae 30 (1938), p. 96–99), every non-trivial ultrafilter is non-measurable for the Haar measure. This contradiction proves the theorem.

XLII, p. 395.

P 1147, R 1. The answer is positive[1].

XLII, p. 396.

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[1] B. Aniszczyk, *A note on "Two classes of measures" (by J. K. Pachl)*, this fascicle, p. 231–232.

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