

RESEARCH PROBLEMS

13. Victor Klee and Albert Wilansky:

Let E be a real Banach space, f a linear functional on E , and X the nullspace of f . (Thus $X = f^\perp = \{x: fx = 0\}$.) Must f be continuous if X is of first category in E ?

An equivalent question: must a maximal subspace be either closed or of second category?

REMARK. If there exists a proper subset C of E which is convex and obeys the condition of Baire (C is open modulo sets of first category), such that $X \subset C$, it is known that f is continuous. (Received February 10, 1966.)

14. A. A. Mullin: *Word-problems in metamathematics.*

Does there exist a finitely presented group G with recursively unsolvable word problem which is an automorphism group of some finitely presented group H with *unsolvable* word problem? If so, must their word problems be of the *same* recursively enumerable degree of unsolvability? Does there exist such a G and an H whose word problems are of *incomparable* degrees? Except when n is the least perfect number the finite symmetric group S_n on n letters is isomorphic to its full automorphism group. In the present context does there exist a G and an H such that G is isomorphic to H ? (Received February 10, 1966.)

15. Fred Gross: *On periodic entire functions.*

PROBLEM. Is it true that if $f(z)$ is entire then $f(f(z))$ is periodic if and only if $f(z)$ is?

The question can be answered in the affirmative if f is of order less than $1/2$ or if f has at most a finite number of fix-points. (z is a fix-point of f if $f(z) = z$.) (Received December 29, 1965.)