RESEARCH PROBLEMS

3. D. R. Hughes. *A problem in group theory.*

Let G be a group and p a prime. Define $H_p(G)$ to be the subgroup of G generated by all the elements of G which do not have order p. Is the following conjecture true: *either* $H_p(G) = 1$, $H_p(G) = G$, *or* $[G : H_p(G)] = p$? For $p = 2$, the conjecture is easily established (Lemma 4, *Partial difference sets*, Amer. J. Math. vol. 78 (1956) pp. 650–674). It is possible that the conjecture has a different status according as G is finite or not. (Received December 26, 1956.)

4. V. L. Klee, Jr. *Banach algebras.*

Suppose A is a real Banach algebra and P is the set of all sums of (finitely many) squares in A. What can be said about the Borel type of P? In particular, must P be a G_δ set? (Received December 26, 1956.)