PROBLEMS FOR SOLUTION

P 128. Let M be the set of square matrices of order n whose entries are real numbers in the interval $a \leq x \leq b$. Show that the maximum value of a determinant of matrices in the set M is attained by a matrix M whose entries are exclusively a and b.

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P 129. Characterize all finite groups such that exactly half of their elements are of order 2 (the identity is not counted).

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P 130. Show that the system $x^n + y^n = u^n + v^n$, $x + y = u + v$ where n is an integer ≥ 2 has only trivial solutions in the real field.

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P 131. If R is a commutative ring with 1, prove that every prime ideal is maximal if and only if R is π-regular, i.e., for every $r \in R$ there exist $s \in R$ and a natural number n such that $r^n s r^n = r^n$.

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