Problemen

Problem Section

Optiver
DERIVATIVES TRADING

Problem A (Folklore)
Let a be an integer. Let $(x_n)_n$ be the sequence determined by $x_1 = a$ and $x_{n+1} = 2x_n^2 - 1$. Show that n and x_n are coprime for all n.

Problem B (Folklore)
Let G be a group with n elements and $S \subset G$ a non-empty subset. Show that the set $S^n := \{s_1 s_2 \cdots s_n | s_i \in S\}$ is a subgroup of G.

Problem C (Folklore)
(a) Given 2007 points in the plane such that no pair has distance strictly less than one, show that one can find a subset of 288 points in which no pair has distance strictly less than $\sqrt{3}$.
(b)* Supposedly the number 288 in part (a) is not optimal. Find upper and lower bounds for the optimal value.

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