Kurschak Competition 1979

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1 The base of a convex pyramid has an odd number of edges. The lateral edges of the pyramid are all equal, and the angles between neighbouring faces are all equal. Show that the base must be a regular polygon.

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2 f is a real-valued function defined on the reals such that $f(x) \leq x$ and $f(x+y) \leq f(x)+f(y)$ for all x, y. Prove that $f(x)=x$ for all x.

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3 An $n \times n$ array of letters is such that no two rows are the same. Show that it must be possible to omit a column, so that the remaining table has no two rows the same.
