



The Five-Gold-Button Math Competition

Problem 2009–11

Let A be a nonsingular $n \times n$ matrix with entries in a field F of characteristic 2. Show that, for any given $\mathbb{X} \in F^n$, one can find a subset \mathcal{S} of columns of A whose sum $\Sigma_{\mathcal{S}}$ differs from \mathbb{X} in all components. (Σ_{\emptyset} is defined to be the zero vector.)

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