

Permutations as solutions of linear Diophantine equations and magic squares

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Using elementary arithmetic we have established various general kinds of permutations $(x_1, x_2, \dots, x_m, y_1, y_2, \dots, y_m) \in S_{2m}$ (m , even number) such that $\sum_{j=1}^m (2j-1)(x_j - y_{m+1-j}) = 0$. Similar results apply to permutations whose orders are successors of multiples of four. We prove that those permutations cannot exist when m is odd. From those permutations we build magic squares.

Keywords: linear Diophantine equations, permutations, parity, magic squares.