# Determinants of Latin Squares of Order 8

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**Abstract**

A *latin square* is an $n \times n$ array of $n$ symbols in which each symbol appears exactly once in each row and column. Regarding each symbol as a variable and taking the determinant, we get a degree-$n$ polynomial in $n$ variables. Can two latin squares $L, M$ have the same determinant, up to a renaming of the variables, apart from the obvious cases when $L$ is obtained from $M$ by a sequence of row interchanges, column interchanges, renaming of variables, and transposition? The answer was known to be no if $n \leq 7$; we show that it is yes for $n = 8$. The latin squares for which this situation occurs have interesting special characteristics.