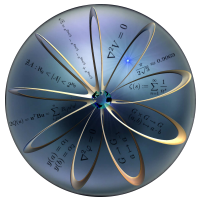

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immanent

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Let S_n denote the symmetric group on n elements. Let $\chi : S_n \to \mathbb{C}$ be a complex character. For any $n \times n$ matrix $A = (a_{ij})_{i,j=1}^n$ define the *immanent* of A as

$$\mathrm{Imm}_\chi(A) = \sum_{\sigma \in S_n} \chi(\sigma) \prod_{j=1}^{n} A_{j\,\sigma(j)}.$$

Special cases of immanents are determinants and permanents — in the case where χ is the constant character ($\chi(x) = 1$ for all $x \in S_n$), $\mathrm{Imm}_\chi(A)$ is the permanent of A. In the case where χ is the sign of the permutation (which is the character of the permutation group associated to the (non-trivial) one-dimensional representation), $\mathrm{Imm}_\chi(A)$ is the determinant of A.