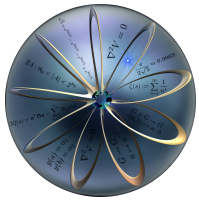

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transposition

Canonical name	Transposition
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Given a finite set $X = \{a_1, a_2, \ldots, a_n\}$, a transposition is a permutation (bijective function of X onto itself) f such that there exist indices i, j such that $f(a_i) = a_j$, $f(a_j) = a_i$ and $f(a_k) = a_k$ for all other indices k. This is often denoted (in the cycle notation) as (a, b).

Example: If $X = \{a, b, c, d, e\}$ the function σ given by

$$\begin{aligned} \sigma(a) &= a \\ \sigma(b) &= e \\ \sigma(c) &= c \\ \sigma(d) &= d \\ \sigma(e) &= b \end{aligned}$$

is a transposition.

One of the main results on symmetric groups states that any permutation can be expressed as composition (product) of transpositions, and for any two decompositions of a given permutation, the number of transpositions is always even or always odd.