

Symmetric groups

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ABSTRACT

Let S_n be the symmetric group on n letters. Fix $n > 5$. Given any nontrivial $\alpha, \beta \in S_n$, we prove that the product $\alpha^{S_n} \beta^{S_n}$ of the conjugacy classes α^{S_n} and β^{S_n} is never a conjugacy class. Furthermore, if n is not even and n is not a multiple of three, then $\alpha^{S_n} \beta^{S_n}$ is the union of at least three distinct conjugacy classes. We also describe the elements $\alpha, \beta \in S_n$ in the case when $\alpha^{S_n} \beta^{S_n}$ is the union of exactly two distinct conjugacy classes.

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