SOLVING THE CLASS EQUATION $x^d = \beta$ IN

AN ALTERNATING GROUP FOR EACH

$\beta \in C^\alpha \cap H^c$ AND $n > 1$

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Abstract

The main purpose of this paper is to solve the class equation $x^d = \beta$ in an alternating group, (This means we try to find the solutions set $X = \{x \in A_n \mid x^d \in A(\beta)\}$) and find the number of these solutions $\mid X \mid$ where β ranges over the conjugacy class $A(\beta)$ in A_n and d is a positive integer. In this paper, we solve the class equation $x^d = \beta$ in A_n where $\beta \in H^c \cap C^\alpha$, for all $n > 1$. H^c is the complement set of H where $H = \{C^\alpha$ of $S_n \mid n > 1$, with all parts α_k of α different and odd$\}$. C^α is conjugacy class of S_n and form class C^α depends on the cycle type α of its elements. If $\lambda \in C^\alpha$ and $\lambda \in H \cap C^\alpha$, then C^α splits into the two classes $C^{\alpha\pm}$ of A_n.