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# ON SOME DOUBLY TRANSITIVE PERMUTATION GROUPS OF DEGREE N AND ORDER $6n(n-1)$

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***Dedicated to Professor K. Ono on his 60th birthday***

The purpose of this paper is to prove the following result.

THEOREM. *Let $\Omega$ be the set of symbols* $1, 2, \cdots, n$. *Let $\mathfrak{G}$ be a doubly transitive group on $\Omega$ of order* $6n(n-1)$ *not containing a regular normal subgroup and let $\mathfrak{K}$ be the stabilizer of the set of symbols* 1 *and* 2. *Assume that $\mathfrak{K}$ is cyclic and independent, i.e., $\mathfrak{K} \cap G^{-1}\mathfrak{K}G = 1$ or $\mathfrak{K}$ for every element $G$ of $\mathfrak{G}$. Then $\mathfrak{G}$ is isomorphic to either* $PGL(2,7)$ *or* $PSL(2,13)$.

We use the standard notation;

$C_{\mathfrak{X}}(\mathfrak{T})$: the centralizer of a subset $\mathfrak{T}$ in a group $\mathfrak{X}$

$N_{\mathfrak{X}}(\mathfrak{T})$: the normalizer of $\mathfrak{T}$ in $\mathfrak{X}$

$\langle \cdots \rangle$: the subgroup generated by $\cdots$

$|\mathfrak{T}|$: the number of elements in $\mathfrak{T}$

$[\mathfrak{X} : \mathfrak{Y}]$: the index of a subgroup $\mathfrak{Y}$ in $\mathfrak{X}$

$\mathfrak{T}^G$: $G^{-1}\mathfrak{T}G$ where $G \in \mathfrak{X}$.

*Proof of Theorem*

1. Let $\mathfrak{H}$ be the stabilizer of the symbol 1. $\mathfrak{K}$ is of order 6 and it is generated by a permutation $K$ whose cyclic structure has the form $(1)(2)\cdots$. Since $\mathfrak{G}$ is doubly transitive on $\Omega$, it contains an involution I with the cyclic structure $(1,2)\cdots$ which is conjugate to $K^3$. Then we have the following decomposition of $\mathfrak{G}$;

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