عنوان مقاله:

New characterization of some linear groups

محل انتشار:

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خلاصه مقاله:

There are a few finite groups that are determined up to isomorphism solely by their order, such as $\mathbb{Z}_{2}$ or $\mathbb{Z}_{15}$. Still other finite groups are determined by their order together with other data, such as the number of elements of each order, the structure of the prime graph, the number of order components, the number of Sylow p-subgroups for each prime p, etc. In this paper, we investigate the possibility of characterizing the projective special linear groups $L_{n}(2)$ by simple conditions when $2^{n}-1$ is a prime number. Our result states that: $G\cong L_{n}(2)$ if and only if $|G|=|L_{n}(2)|$ and G has one conjugacy class length $\frac{|L_{n}(2)|}{2^{n}-1}$, where $2^{n}-1=p$ is a prime number. Furthermore, we will show that Thompson's conjecture holds for the simple groups $L_{n}(2)$, where $2^{n}-1$ prime is a prime number. By Thompson's conjecture if L is a finite non-Abelian simple group, G is a finite group with a trivial center, and the set of the conjugacy classes size of L is equal to G, then $L\cong G$.

کلمات کلیدی:

Projective special linear groups, conjugacy class size, Thompson's conjecture

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