Title: Some characterizations of $L_9(2)$ related to its prime graph

Author(s): Behrooz Khosravi

Let $G$ be a finite group. The prime graph of $G$ is denoted by $\Gamma(G)$. In this paper as the main result we determine finite groups $G$ such that $\Gamma(G) = \Gamma(L_9(2))$. Let $\pi_e(G)$ be the set of element orders of $G$, which is called the spectrum of $G$. Denote by $h(G)$ the number of isomorphism classes of finite groups $H$ satisfying $\pi_e(H) = \pi_e(G)$. It is proved that some finite groups are uniquely determined by their spectrum, i.e. $h(G) = 1$. As a consequence of our result we prove that the simple group $L_9(2)$ is uniquely determined by its spectrum. The degree pattern of a finite group is denoted by $D(G)$. At last we prove that if $G$ is a finite group such that $|G| = |L_9(2)|$ and $D(G) = D(L_9(2))$, then $G \cong L_9(2)$.

Address:
Behrooz Khosravi
Dept. of Pure Math.
Faculty of Math. and Computer Sci.
Amirkabir University of Technology (Tehran Polytechnic),
424, Hafez Ave., Tehran 15914
Iran

and

School of Mathematics
Institute for Research in Fundamental Sciences (IPM)
P.O. Box: 19395-5746, Tehran
Iran