Title: Characterization of finite simple group A_{p+3} by its order and degree pattern

Author(s): Ali Mahmoudifar and Behrooz Khosravi

It is proved that some finite groups are OD-characterizable, i.e. they are uniquely determined by order and degree pattern. In [R. KOGANI-MOGHADAM and A. R. MOGHADDAMFAR, Groups with the same order and degree pattern, *Science China Mathematics*, 2012], the authors posed the following conjecture:
Conjecture. *All alternating groups A_m with $m \neq 10$ are* OD-*characterizable.*
Up to now it has been proved that this conjecture is correct for $m = p$, $p + 1$, $p + 2$, where p is a prime number. Also it has been proved that the conjecture is true for A_{106} and A_{112}. In this paper, by an example we show that this conjecture is not true in general and so we reformulate this conjecture as follows:
Conjecture. *If $m \neq 10$ is even, then all alternating groups A_m are* OD-*characterizable.*
Recently, the OD-characterization of A_{p+3}, where $p \neq 7$ and $p < 100$ has been proved. In this paper we continue this work and we prove that if $p \neq 7$ is a prime number, then the alternating group A_{p+3} is OD-characterizable. We note that this is the first work that verify an infinite family of alternating groups with connected prime graphs.

Address:
Ali Mahmoudifar
Department of Pure Mathematic
Faculty of Mathematic
and Computer Science
Amirkabir University of Technology
(Tehran Polytechnic)
424, Hafez Ave., Tehran 15914
Iran

Address:
Behrooz Khosravi
Department of Pure Mathematic
Faculty of Mathematic
and Computer Science
Amirkabir University of Technology
(Tehran Polytechnic)
424, Hafez Ave., Tehran 15914
Iran