

Pseudoachromatic and connected-pseudoachromatic indices of the complete graph

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In this paper we study these two parameters for the complete graph K_n . First, we prove that, when q is a power of 2 and $n = q^2 + q + 1$, the pseudoachromatic index $\psi'(K_n)$ of the complete graph K_n is at least $q^3 + 2q - 3$; which improves the bound $q^3 + q$ given by Araujo, Montellano and Strausz [J Graph Theory 66 (2011), 89–97]. Our main contribution is to improve the linear lower bound for the connected pseudoachromatic index given by Abrams and Berman [Australas J Combin 60 (2014), 314–324] and provide an upper bound, these two bounds prove that for any integer $n \geq 8$ the order of $\psi'_c(K_n)$ is $n^{3/2}$.

Remark: The colorations that induce the lower bounds are given using the structure of Projectives Planes.