

A note on arbitrarily vertex decomposable graphs

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Abstract

A graph G of order n is said to be arbitrarily vertex decomposable if for each sequence (n_1, \dots, n_k) of positive integers such that $n_1 + \dots + n_k = n$ there exists a partition (V_1, \dots, V_k) of the vertex set of G such that for each $i \in \{1, \dots, k\}$, V_i induces a connected subgraph of G on n_i vertices.

In this paper we show that if G is a two-connected graph on n vertices with the independence number at most $\lceil n/2 \rceil$ and such that the degree sum of any pair of nonadjacent vertices is at least $n - 3$, then G is arbitrarily vertex decomposable. We present another result for connected graphs satisfying a similar condition where the bound $n - 3$ is replaced by $n - 2$.