

Decompose a graph into two disjoint cycles

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Consider a simple and undirected graph G . A set of subgraphs of G is disjoint if no two of them share a common vertex in G . Let $|G| = n$ be the total number of vertices in G . For $i = 1, 2$, let n_i be an integer with $n_i \geq 3$, and $n_1 + n_2 = n$. Let $e(\overline{G})$ be the number of edges in the complement of G . We prove that if $e(\overline{G}) \leq n - 3$, then G contains two disjoint cycles with lengths n_1 and n_2 . The bound $n - 3$ is sharp.