Theorem 5.18

Let G be a k-connected graph and let S be any set of k vertices. If a graph H is obtained from G by adding a new vertex w and joining w to the vertices of S, then H is also k-connected.

Corollary 5.19

If G is a k-connected graph and $u, v_1, v_2, \ldots, v_k$ are $k+1$ distinct vertices of G, then there exists internally disjoint u—v_i paths $(1 \leq i \leq k)$ in G.