

Section 4.6
Connectivity and Networks

TWO SIMILAR RESULTS

Menger's Theorem relates the maximum number of disjoint paths and the minimum number of vertices in a separating set. The Max Flow-Min Cut Theorem relates the maximum flow and the minimum capacity of a cut. Both involve the equality of two quantities, one of which is a maximum and the other a minimum. The Max Flow-Min Cut Theorem can be used to prove Menger's Theorem.

MENGER'S THEOREM

Theorem 4.6.1 (Menger's Theorem): For distinct nonadjacent vertices u and w in a graph G , the maximum number of pairwise internally disjoint $u - w$ paths equals the minimum number of vertices in a $u - w$ separating set.

**EDGE VERSION OF MENGER'S
THEOREM**

Theorem 4.6.2: In a graph G , the maximum number of edge disjoint $u - v$ paths equals the number of edges in a $u - v$ separating set.
