

The need to understand the structure of complex networks increases as both their complexity and the dependency of human society on them grows. Network centralities help to recognize the key elements of these networks. Betweenness centrality is a network centrality measure based on shortest paths. More precisely, the contribution of a pair of vertices u, v to a vertex $w \neq u, v$ is the fraction of the shortest uv -paths which lead through w . Betweenness centrality is then given by the sum of contributions of all pairs of vertices $u, v \neq w$ to w . In this work, we have summarized known results regarding both exact values and bounds on betweenness. Additionally, we have improved an existing bound and obtained more exact formulation for r -regular graphs. We have made two major contributions about betweenness uniform graphs, whose vertices have uniform betweenness value. The first is that all betweenness uniform graphs of order n with maximal degree $n - k$ have diameter at most k , by which we have solved a conjecture posed in the literature. The second major result is that betweenness uniform graphs nonisomorphic to a cycle that are either vertex- or edge-transitive are 3-connected, by which we have partially solved another conjecture.