1135-05-118   **Hector Miranda***, School of Mathematical Sciences, 85 Lomb Memorial Drive, Rochester
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Classifications of Edge-Transitive and Edge-Betweenness-Uniform Graphs.

A graph is edge-transitive (vertex-transitive) if its automorphism group acts transitively on its edges (vertices). We are the first to completely determine all (connected) edge-transitive graphs on 12 through 20 vertices. Furthermore, we identified infinite classes of edge-transitive graphs, including all graphs of the form $K_m \times K_n$; several classes of 3-circulants; and a construction for an edge-transitive and connected biregular (non-trivial) subgraph of $K_{m,n}$ for every pair (m, n) with $gcd(m, n) > 2$. Finally, we investigate uniform edge betweenness centrality, a necessary condition for edge-transitivity. The betweenness centrality of an edge is the fraction of shortest paths between all pairs of vertices passing through that edge. A graph is said to have uniform edge betweenness centrality if the edge betweenness centrality is the same value for all edges. Graphs that have uniform edge betweenness centrality but are not edge-transitive appear to be rare; of the over 11.9 million (connected) graphs on less than or equal to 10 vertices, only 4 have uniform edge betweenness centrality but not edge-transitivity. However we have been able to identify infinite classes of circulant graphs that have uniform edge betweenness centrality but are not edge-transitive. (Received July 29, 2017)