

1027-05-25

Steve Butler* (sbutler@math.ucsd.edu), Department of Mathematics, University of California, San Diego, La Jolla, CA 92093-0112. *Induced universal graphs for graphs with bounded maximum degree.*

For a family \mathcal{F} of graphs, a graph U is induced-universal for \mathcal{F} if every graph in \mathcal{F} is an induced subgraph of U . We give a construction for an induced-universal graph for the family of graphs on n vertices with degree at most r , which has $Cn^{\lfloor (r+1)/2 \rfloor}$ vertices and $Dn^{2\lfloor (r+1)/2 \rfloor - 1}$ edges, where C and D are constants depending only on r . This construction is nearly optimal when r is even in that such an induced-universal graph must have at least $cn^{r/2}$ vertices for some c depending only on r .

Our construction is explicit in that no probabilistic tools are needed to show that the graph exists or that a given graph is induced-universal. We extend our construction to multigraphs and directed graphs with bounded degree. (Received January 16, 2007)