

## REQUIRING THAT MINIMAL SEPARATORS INDUCE COMPLETE MULTIPARTITE SUBGRAPHS

TERRY A. MCKEE

*Department of Mathematics and Statistics*  
*Wright State University*  
*Dayton, Ohio 45435 USA*

**e-mail:** terry.mckee@wright.edu

### Abstract

Complete multipartite graphs range from complete graphs (with every partite set a singleton) to edgeless graphs (with a unique partite set). Requiring minimal separators to all induce one or the other of these extremes characterizes, respectively, the classical chordal graphs and the emergent unichord-free graphs. New theorems characterize several subclasses of the graphs whose minimal separators induce complete multipartite subgraphs, in particular the graphs that are 2-clique sums of complete, cycle, wheel, and octahedron graphs.

**Keywords:** minimal separator, complete multipartite graph, chordal graph, unichord-free graph.

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### REFERENCES

- [1] A. Brandstädt, V.B. Le and J.P. Spinrad, *Graph Classes: A Survey* (Society for Industrial and Applied Mathematics, Philadelphia, 1999).  
doi:10.1137/1.9780898719796
- [2] R.C.S. Machado, C.M.H. de Figueiredo and N. Trotignon, *Complexity of colouring problems restricted to unichord-free and {square, unichord}-free graphs*, *Discrete Appl. Math.* **164** (2014) 191–199.  
doi:10.1016/j.dam.2012.02.016
- [3] R.C.S. Machado, C.M.H. de Figueiredo and K. Vušković, *Chromatic index of graphs with no cycle with a unique chord*, *Theoret. Comput. Sci.* **411** (2010) 1221–1234.  
doi:10.1016/j.tcs.2009.12.018
- [4] T.A. McKee, *Independent separator graphs*, *Util. Math.* **73** (2007) 217–224.

- [5] T.A. McKee, *Minimal vertex separators and 3-skein subgraphs*, Bull. Inst. Combin. Appl. **72** (2014) 19–24.
- [6] T.A. McKee, *A new characterization of unichord-free graphs*, Discuss. Math. Graph Theory **35** (2015) 765–771.  
doi:10.7151/dmgt.1831
- [7] T.A. McKee and F.R. McMorris, *Topics in Intersection Graph Theory* (Society for Industrial and Applied Mathematics, Philadelphia, 1999).  
doi:10.1137/1.9780898719802
- [8] N. Trotignon and K. Vušković, *A structure theorem for graphs with no cycle with a unique chord and its consequences*, J. Graph Theory **63** (2010) 31–67.  
doi:10.1002/jgt.20405

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