Discussiones Mathematicae
Graph Theory 34 (2014) 641–Graph Theory 34 (2014) 641–1 doi:10.7151/dmgt.1734

Note

A NOTE ON A BROKEN-CYCLE THEOREM FOR HYPERGRAPHS

Martin Trinks

Hochschule Mittweida, University of Applied Sciences
Faculty Mathematics / Sciences / Computer Science
Technikumplatz 17, 09648 Mittweida, Germany

e-mail: trinks@hs-mittweida.de

Abstract

Whitney's Broken-cycle Theorem states the chromatic polynomial of a graph as a sum over special edge subsets. We give a definition of cycles in hypergraphs that preserves the statement of the theorem there.

Keywords: Broken-cycle Theorem, hypergraphs, cycles, chromatic polynomial, graph polynomials.

2010 Mathematics Subject Classification: 05C31, 05C15.

References

[1] C. Berge, Hypergraphs, Vol. 45 (North-Holland Mathematical Library, North-Holland, 1989).

[2] K. Dohmen, *A broken-circuits-theorem for hypergraphs*, Arch. Math. **64** (1995) 159–162.
doi:10.1007/BF01196637

[3] F.M. Dong, K.M. Koh, and K.L. Teo, Chromatic polynomials and chromaticity of graphs (World Scientific Publishing, 2005).

[4] P. Jégou and S.N. Ndiaye, *On the notion of cycles in hypergraphs*, Discrete Math. **309** (2009) 6535–6543.
doi:10.1016/j.disc.2009.06.035

[5] M. Trinks, Graph polynomials and their representations, PhD Thesis, Technische Universität Bergakademie Freiberg, (2012).

[6] H. Whitney, *The coloring of graphs*, Proc. Natl. Acad. Sci. USA **17(2)** (1931) 122–125.
doi:10.1073/pnas.17.2.122

[7] H. Whitney, *A logical expansion in mathematics*, Bull. Amer. Math. Soc. **38(8)** (1932) 572–579.
doi:10.1090/S0002-9904-1932-05460-X

Received 4 October 2012
Accepted 14 February 2013