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03 ▶ Mathematical Logic and Foundations

*84T-03-466 HAJNAL ANDRÉKA, J. DONALD MONK, AND ISTVÁN NÉMETI, University of Colorado, Boulder, Colorado 80309, USA, and Math. Inst. Hungar. Acad. Sci., Budapest 1376, P. F. 428, Hungary. ***Homomorphic images of weak cylindric set algebras with infinite bases.***

THEOREM. ***Every cylindric set algebra with an infinite base is a homomorphic image of a weak cylindric set algebra with an infinite base.***

This theorem is non-trivial only for infinite dimensions. It has as corollaries several results on the relationships between the main classes of cylindric set algebra–like structures which greatly simplify the picture of known relationships. For example, for $\alpha \geq \omega$, $\mathbf{H}_\infty\mathbf{Ws}_\alpha = \mathbf{H}_\infty\mathbf{Cs}_\alpha = \mathbf{H}_\infty\mathbf{Cs}_\alpha^{reg} = \mathbf{I}_\infty\mathbf{Cs}_\alpha = \mathbf{HP}_\infty\mathbf{Ws}_\alpha = \mathbf{HP}_\infty\mathbf{Cs}_\alpha^{reg} = \mathbf{HSP}_\infty\mathbf{Gs}_\alpha$, using the notation of Henkin, Monk, Tarski, Andréka, Németi, **Cylindric Set Algebras**, Lecture Notes in Mathematics, vol. 883, Springer 1981. The theorem solves Problems I.5, I.7, I.8 of that book. It will appear in **Cylindric Algebras, Part II**, by Henkin, Monk, and Tarski (forthcoming). (Received September 4, 1984)

84T-03-470 BARRY COOPER, University of Leeds, England. A jump class of non-cappable recursively enumerable degrees. Preliminary report.

Theorem. There exists a degree $\underset{\sim}{c} > \underset{\sim}{0}'$ and recursively enumerable in $\underset{\sim}{0}'$ such that for each recursively enumerable degree $\underset{\sim}{a}$ if $\underset{\sim}{a}' = \underset{\sim}{c}$ then for no recursively enumerable $\underset{\sim}{b}$ do we have $\underset{\sim}{a} \wedge \underset{\sim}{b} = \underset{\sim}{0}$: that is, $\underset{\sim}{c}$ is not the jump of half a minimal pair of r.e. degrees. (Received July 17, 1984)

84T-03-471 FRANCOISE DELON, Université Paris 7, U. E. R. de Mathématique et Informatique, 2 place Jussieu, 75 251 Paris, Cedex 05, France. ***Rolle fields and rings.***

Brown, Craven, and Pelling have proved that if the polynomials over an ordered field K satisfy Rolle's theorem, they satisfy it for any ordering on K. We say that such a field is a Rolle field. We prove that this is a first order property in the language of rings, that the theory of Rolle fields is decidable, and we describe all its completions. Then we give a common generalization of these fields and the real closed rings defined by Cherlin and Dickmann. (Received August 20, 1984) (Sponsored by Gabriel Sabbagh)

05 ▶ Combinatorics

*84T-05-463 R.J. FAUDREE, R.H. SCHELP, Memphis State University, Memphis, Tennessee 38152; R.J. GOULD, Emory University, Atlanta, Georgia 30322; M.S. JACOBSON, University of Louisville, Louisville, Kentucky 40292. Extremal Results Involving Neighborhood Unions. Preliminary report.

Several extremal questions for graphs satisfying the property (*) $|N(x) \cup N(y)| \geq s$ for every pair of nonadjacent vertices $x,y \in V(G)$, are investigated. Values for s are determined which ensure s-matchings, 1-factors, path lengths and cycle lengths. In particular, if G satisfies (*) and has order P,

(a) for $1 \leq s \leq \frac{P-2}{2}$ and G connected, then G contains an s-matching.

(b) for $s = \frac{P-1}{2}$ and G connected with P odd, then G contains an s-matching.

(c) for $s = \frac{P}{2}$, P even, $P \geq 4$ and G 2-connected, then G contains a 1-factor.

(d) G 2-connected, $P \geq 2s + 1$, then G contains a path of order at least $\left\lceil \frac{3}{2} s \right\rceil + 2$.

(e) for $s \geq 3$, G connected, then G contains a cycle of order at least $\left\lceil \frac{\ell + 2}{2} \right\rceil$.

(f) G 2-connected, then G contains a cycle of order at least $\ell + 2$.

Bounds on the order of graphs satisfying (*) with edge independence number t are also examined. (Received August 8, 1984)