

Forthcoming papers

The following papers will be published in future issues:

Michael A. Henning, Bounds relating generalized domination parameters

The domination number $\gamma(G)$ and the total domination number $\gamma_t(G)$ of a graph G are generalized to the K_n -domination number $\gamma_{K_n}(G)$ and the total K_n -domination number $\gamma'_{K_n}(G)$ for $n \geq 2$, where $\gamma(G) = \gamma_{K_2}(G)$ and $\gamma_t(G) = \gamma'_{K_2}(G)$. K_n -connectivity is defined and, for every integer $n \geq 2$, the existence of a K_n -connected graph G of order at least $n + 1$ for which

$$\gamma_{K_n}(G) + \gamma'_{K_n}(G) = \left(\frac{3n-2}{n^2}\right)p(G)$$

is established. We conjecture that, if G is a K_n -connected graph of order at least $n + 1$, then

$$\gamma_{K_n}(G) + \gamma'_{K_n}(G) \leq \left(\frac{3n-2}{n^2}\right)p(G).$$

This conjecture generalizes the result for $n = 2$ of Allan, Laskar and Hedetniemi. We prove the conjecture for $n = 3$. Further, it is shown that if G is a K_3 -connected graph of order at least 4 that satisfies the condition that, for each edge e of G , $G - e$ contains at least one K_3 -isolated vertex, then

$$\gamma_{K_3}(G) + \gamma'_{K_3}(G) \leq (3p)/4$$

and we show that this bound is best possible.

Earl S. Kramer, Spyros S. Magliveras, Tran van Trung and Qiu-Rong Wu, Some perpendicular arrays for arbitrarily large t

We show that perpendicular arrays exist for arbitrarily large t and with $\lambda = 1$. In particular, if d divides $(t+1)$ then there is a $PA_1(t, t+1, t+((t+1)/d))$. If $v \equiv 1$ or $2 \pmod{3}$ then there is a $PA_\lambda(3, 4, v)$ for any λ . If 3 divides λ then there is a $PA_\lambda(3, 4, v)$ for any v . If $n \geq 2$ there is a $PA_1(4, 5, 2^n + 1)$. Using recursive constructions we exhibit several infinite families of perpendicular arrays with $t \geq 3$ and relatively small λ . We finally discuss methods of constructing perpendicular arrays based on automorphism groups. These methods allow the construction of PA 's with $(k-t) > 1$.

Dragan Marušič, Raffaele Scapellato and Norma Zagaglia Salvi, Generalized Cayley graphs

We introduce the concept of generalized Cayley graphs and study their properties, in particular relative to double coverings of graphs.

Rodica Simion and Daniel Ullman, On the structure of the lattice of noncrossing partitions

We show that the lattice of noncrossing (set) partitions is self-dual and that it admits a symmetric chain decomposition. The self-duality is proved via an order-reversing involution. Two proofs are given of the existence of the symmetric chain decomposition, one recursive and one constructive. Several identities involving Catalan numbers emerge from the construction of the symmetric chain decomposition.

D. R. Woodall, Local and global proportionality

The problem considered here is that posed by Fishburn, Hwang and Lee concerning the proportion of elements of one colour in a 2-coloured ring. It is required to deduce global information about this proportion from rather restricted local information. The problem is more or less solved for simple rings, some bounds are obtained in general, and conjectures are made concerning both the original problem and its generalizations to different sorts of graph.

Mao-Cheng Cai, On some factor theorems of graphs

The aim of this note is to show that some recently published results on graph factors derive fairly easily from Lovász' (g, f) -Factor Theorems.

Paul Erdős, Zoltán Füredi and Zsolt Tuza, Saturated r -uniform hypergraphs

The following dual version of Turán's problem is considered: For a given r -uniform hypergraph F , determine the minimum number of edges in an r -uniform hypergraph H on n vertices, such that $F \notin H$ but a subhypergraph isomorphic to F occurs whenever a new edge (r -tuple) is added to H . For some types of F we find the exact value of the minimum or describe its asymptotic behavior as n tends to infinity; namely, for $H_r(r+1, r)$, $H_r(2r-2, 2)$ and $H_r(r+1, 3)$, where $H_r(p, q)$ denotes the family of all r -uniform hypergraphs with p vertices and q edges. Several problems remain open.

M. Hofmeister, Isomorphisms and automorphisms of graph coverings

Any group of automorphisms of a graph G induces a notion of isomorphism between covering projections onto G . Liftings of automorphisms of G are considered, and the isomorphism classes of covering projections onto G are classified by means of permutation voltage assignments.

Bruce M. Landman, Ramsey functions related to the van der Waerden numbers

Ramsey functions similar to the van der Waerden numbers $w(n)$ are studied. If A' is a class of sequences which includes the n -term arithmetic progressions, then we define $w'(n)$ to be the least positive integer guaranteeing that if $\{1, 2, \dots, w'(n)\}$ is 2-colored, then there exists a monochromatic member of A' . We consider increasing sequences of positive integers $\{x_1, \dots, x_n\}$ which are either arithmetic progressions or for which there exists a polynomial $p(x)$ with integer coefficients satisfying $p(x_i) = x_{i+1}$. Various further restrictions are placed on the types of polynomials allowed. Upper bounds are given for the corresponding functions $w'(n)$. In addition, it is shown that the existence of somewhat stronger bounds on $w'(n)$ would imply similar bounds for $w(n)$.