

1035-05-1189

Evan Heidtmann* (eheidtmann09@wooster.edu), Department of Mathematics and Computer Science, Taylor Hall, The College of Wooster, Wooster, OH 44691, **Timothy Hopper** (hoppertd1@gcc.edu), Department of Mathematics, Grove City College, 100 Campus Drive, Box 3121, Grove City, PA 16127, and **Stanislaw Radziszowski** (spr@cs.rit.edu), Department of Computer Science, Golisano College of Computing and Inf. Sci., Rochester Institute of Technology, Rochester, NY 14623. *On Ramsey Numbers for Quadrilaterals in 3 and 4 Colors.*

We discuss the two multicolor Ramsey numbers concerning 4-cycles in 3 and 4 colors. For 3 colors, we find that there are exactly 1000 nonisomorphic critical colorings of K_{10} for the Ramsey number $R_3(C_4) = 11$, verifying our results using two independent computations. One of these colorings contains the Petersen graph as one of the colors and is more symmetric than all published colorings for this Ramsey number. In 4 colors, we were not able to improve the currently best known bounds $18 \leq R_4(C_4) \leq 19$, but we gather extensive computational evidence and then conjecture that no 4-coloring of K_{18} can avoid monochromatic C_4 's. We generate more than 28,000 nonisomorphic C_4 -free 4-colorings of K_{17} (only 2 of which were previously published), but none can be extended to successfully color K_{18} . Several searches, both heuristic and deterministic, also failed to produce a desired coloring. An exhaustive search seems to be extremely difficult computationally, even with all known constraints. We conjecture that $R_4(C_4) = 18$. (Received September 19, 2007)