1116-05-135 **Alexander Neal Riasanovsky*** (alexneal@math.upenn.edu), Department of Mathematics, University of Pennsylvania, Philadelphia, PA 19104-6395, and **John Wallace**, Department of Mathematics, Trinity College, Hartford, CT 06016. *Zarankiewicz and Bipartite Ramsey Numbers.* Preliminary report.

The Zarankiewicz number $z(b;s)$ is the maximum size of a subgraph of $K_{b,b}$ which does not contain $K_{s,s}$ as a subgraph. The two-color bipartite Ramsey number $b(s,t)$ is the smallest integer b such that any coloring of the edges of $K_{b,b}$ with two colors contains a $K_{s,s}$ in the first color or a $K_{t,t}$ in the second color.

In this work, we design and exploit a computational method for bounding and computing Zarankiewicz numbers. Using it, we obtain several new values and bounds on $z(b;s)$ for $3 \leq s \leq 5$. Our approach and more knowledge about $z(b;s)$ permit us to improve some of the results on bipartite Ramsey numbers obtained by Goddard, Henning and Oellermann in 2000. In particular, we compute the smallest previously unknown bipartite Ramsey number, $b(2,5) = 17$. Moreover, we prove that up to isomorphism there exists a unique 2-coloring which witnesses the lower bound $16 < b(2,5)$. We also find tight bounds on $b(2,2,3)$, $17 \leq b(2,2,3) \leq 18$, which currently is the smallest open case for multicolor bipartite Ramsey numbers. (Received August 05, 2015)