MATEMATISKA INSTITUTIONEN
STOCKHOLMS UNIVERSITET
Avd. Matematik

SJÄLVSTÄNDIGT ARBETE I MATEMATIK

Tisdagen den 20 november kl. 16.00–17.00 presenterar Mikael Hansson sitt arbete "On Generalised Ramsey Numbers for Two Sets of Cycles" (30 högskolepoäng, avancerad nivå).

Handledare: Jörgen Backelin

Plats: Sal 21, hus 5, Kräftriket

Abstract: Given s non-empty sets $\mathscr{G}_1, \ldots, \mathscr{G}_s$ of graphs, the generalised Ramsey number $R(\mathscr{G}_1, \ldots, \mathscr{G}_s)$ is defined as the least positive integer n, such that whenever each edge of the complete graph K_n on n vertices is coloured with one of the colours $c_1, \ldots, c_s$, K_n contains a c_i-coloured G_i, for some $i \in \{1, ..., s\}$ and some G_i in $\mathscr{G}_i$.

In this thesis, we first prove some basic, general properties of generalised Ramsey numbers, among others that they always exist. We then compute a number of (in fact, uncountably many) two colour generalised Ramsey numbers, such that $\mathscr{G}_1$ and $\mathscr{G}_2$ are sets of cycles. This generalises previous results of Erdös, Faudree, Rosta, Rousseau, and Schelp from the 1970s.

Above all, we determine all generalised Ramsey numbers $R(\mathscr{G}_1, \mathscr{G}_2)$ such that the union of $\mathscr{G}_1$ and $\mathscr{G}_2$ contains a cycle of length 3, 4, or 5. Furthermore, we give a conjecture for the general case. We also prove some results on graphs that contain no cycle of odd length, except possibly a number of 3-cycles.

Alla intresserade är välkomna!