

Lethbridge Number Theory and Combinatorics Seminar

Monday — December 7, 2015

Room: **C630**

Time: **12:00 to 12:50 p.m.**

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Colour-permuting and colour-preserving automorphisms

Abstract: A Cayley graph $\text{Cay}(G; S)$ on a group G with connection set $S = S^{-1}$ is the graph whose vertices are the elements of G , with $g \sim h$ if and only if $g^{-1}h \in S$. If we assign a colour $c(s)$ to each $s \in S$ so that $c(s) = c(s^{-1})$ and $c(s) \neq c(s)$ when $s \neq s, s^{-1}$, this is a natural (but not proper) edge-colouring of the Cayley graph.

The most natural automorphisms of any Cayley graph are those that come directly from the group structure: left-multiplication by any element of G ; and group automorphisms of G that fix S setwise. It is easy to see that these graph automorphisms either preserve or permute the colours in the natural edge-colouring defined above. Conversely, we can ask: if a graph automorphism preserves or permutes the colours in this natural edge-colouring, need it come from the group structure in one of these two ways?

I will show that in general, the answer to this question is no. I will explore the answer to this question for a variety of families of groups and of Cayley graphs on these groups. I will touch on work by other authors that explores similar questions coming from closely-related colourings.

This is based on joint work with Ademir Hujdurović, Klavdija Kutnar, and Dave Witte Morris.

EVERYONE IS WELCOME!

Visit the seminar web page at <http://www.cs.uleth.ca/~nathanng/ntcoseminar/>



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