

RYERSON UNIVERSITY
DEPARTMENT OF MATHEMATICS
GRAPHS AT RYERSON (G@R) SEMINAR

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Date: Monday, March 7, 2016

Time: noon

Location: ENG 210

On the Hamilton-Waterloo problem with odd cycle lengths

Abstract:

The Hamilton-Waterloo problem $HWP(v; m, n; \alpha, \beta)$ asks whether there exists a decomposition of K_v (if v is odd) or $K_v - I$ (if v is even) into α C_m -factors and β C_n -factors, where $3 \leq m \leq n$. Necessarily, if such a decomposition exists, then m and n are divisors of v and $\alpha + \beta = \lfloor (v - 1)/2 \rfloor$.

In this talk, we consider the Hamilton-Waterloo problem for two odd cycle lengths m and n . In this case, we show that the obvious necessary conditions for the existence of a decomposition of K_v into α C_m -factors and β C_n -factors are sufficient whenever v is an odd multiple of mn and $v > mn$, except possibly if $\beta \in \{1, 3\}$ or for five specific values of (m, n, β) . If $v = mn$ is odd, we solve the problem whenever $\beta > (n + 5)/2$, except possibly when $(m, \alpha) = (3, 2), (3, 4)$ or for seven values of (m, n, α, β) . In particular, in the case that v is odd and the cycle lengths $m, n \geq 9$ are relatively prime odd integers, this result settles the Hamilton-Waterloo problem except when $\beta \in \{1, 3\}$ or $v = mn$ and $\beta \leq (n + 5)/2$.

This is joint work with Peter Danziger and Tommaso Traetta.

ALL FACULTY, STAFF, STUDENTS AND GUESTS ARE WELCOME TO ATTEND