Lethbridge Number Theory and Combinatorics Seminar

TUESDAY — June 28, 2016
Room: C630
Time: **2:00 to 2:50 p.m.**

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Pairs of elliptic curves and their Frobenius fields

Abstract: Given an elliptic curve E over a number field K. The Frobenius field attached to E at a prime p is the splitting field of the characteristic polynomial of the Frobenius endomorphism acting on the ℓ-adic Tate module of E (ℓ a prime different from p) over the rationals. Thus, the splitting field is either of degree 1 or degree 2 over the rationals.

Let E_1 and E_2 be elliptic curves defined over a number field K, with at least one of them without complex multiplication. We prove that the set of places v of K of good reduction such that the corresponding Frobenius fields are equal has positive upper density if and only if E_1 and E_2 are isogenous over some extension of K.

For an elliptic curve E defined over a number field K, we show that the set of finite places of K such that the Frobenius field at v equals a fixed imaginary quadratic field F has positive upper density if and only if E has complex multiplication by F.

Time permits we will provide a sketch of a result about two dimensional ℓ-adic Galois representations that we will need using an algebraic density theorem due to Rajan.

EVERYONE IS WELCOME!

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

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