1086-11-2901 **Thao Do**, **Jared Hallet**, **Elliot Wells**, **Susan Yuhou Xia*** (yxia@brynmawr.edu) and **Michael Zieve**. *Polynomial Equations with Infinitely Many Solutions over an Algebraic Number Field.* Preliminary report.

In this paper, we will describe all polynomials F and G with algebraic coefficients for which the equation $F(X) = G(Y)$ has infinitely many solutions in some algebraic number field. This is equivalent to the following problem: Let $\mathbb{K}$ be an algebraically closed field with characteristic zero. Classify all nonconstant $F(T), G(T) \in \mathbb{K}[T]$ such that $F(X) - G(Y)$ has an irreducible factor $H(X,Y) \in \mathbb{K}[X,Y]$ for which the curve $H(X,Y) = 0$ has genus zero or one. The discussion of the problem is divided into two cases: $F(X) - G(Y)$ is irreducible of genus 0 or 1 and $F(X) - G(Y)$ is reducible with an irreducible factor of genus 0 or 1. The classification of the irreducible case is done by using the Riemann-Hurwitz formula. We use monodromy groups of indecomposable polynomials and ramification to finish the classification of the reducible case. We are able to show that in most situations the reducible case does not happen. (Received September 26, 2012)