

Integral points on hyperelliptic curves

Abstract:

We consider a hyperelliptic curve – one having an equation like $y^2 = f(x)$, where f is a polynomial of degree at least 3 with integral coefficients and no double roots. It is known that such an equation has only a finite number of integral solutions, but finding them may not be an easy task.

I will explain one method, The Chabauty method, that can find integral (in fact, rational) solutions to the equation above under a certain numerical assumption: The rank of the group of rational points of its Jacobian variety is smaller than the genus. I will then report on joint work with Jennifer Balakrishnan and Steffen Mueller which gives a new method for finding integral solutions, and possibly good bounds on the number of integral solutions, in case the rank equals the genus.

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