Exposé court

123   *Existence of the solutions to the Brocard-Ramanujan problem for norm forms*

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The Brocard-Ramanujan problem, which is an unsolved problem in number theory, is to find integer solutions (x, ℓ) of $x^2 - 1 = \ell!$. Many analogs of this problem are currently being considered. As one example, it is known that there are at most only finitely many algebraic integer solutions (x, ℓ), up to a unit factor, to the equations $N_K(x) = \ell!$, where N_K are the norms of number fields $K/\mathbf{Q}$. In this talk, we construct infinitely many number fields K such that $N_K(x) = \ell!$ has at least 22 solutions for positive integers ℓ.