Number Theory Seminar

Tuesday, March 19th, 2019

4:00 pm in Hume 321

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On the congruence equation $\overline{a} + \overline{b} \equiv \overline{c} \pmod{p}$

ABSTRACT

In this talk, we will consider the congruence equation $\overline{a}+\overline{b} \equiv \overline{c} \pmod{p}$ with $1 \leq a, b, c \leq H$ where $\overline{x}$ stands for the multiplicative inverse of x (mod p). We prove that its number of solutions is asymptotic to H^3/p when $H > p^{2/3+o(1)}$ by estimating a certain average of Kloosterman sums via Gauss sums. On the other hand, when $H < p^{1/2}\sqrt{\log p}$, the number of solutions has order of magnitude $H \log H$. It would be interesting to understand better its transition of behavior. By transforming the question slightly, one can relate the problem to a certain first moment of Dirichlet L-functions at $s = 1$. This is still work in progress.