Homework 3 solutions

Additive number theory seminar

The following problems are optional, but may be useful practice.

Problem 1. Let $h \geq 3$ be an integer, and $N \geq 2$ an integer such that $N \equiv h \pmod 2$, i.e. N and h are either both odd or both even. Using similar methods and lemmas to the proof of Vinogradov's theorem in Nathanson, find an asymptotic formula for the number of ways $r_h(N)$ that N can be written as a sum of h primes.

Problem 2. Explain where your solution to Problem 1 fails for $h = 2$, if you did it, or equivalently where Vinogradov's method fails to prove the strong Goldbach conjecture.