MATH 2601 - FoMP

Instructor : Prasad Tetali, office: Skiles 132, email: tetali@math.gatech.edu

Due: **Friday (in class), August 31, 2018**

Problem 1. Complete the following proof (by contradiction) that there are infinitely many primes of the form $4k + 3$.

Suppose $3 = p_1, 7 = p_2, p_3, \ldots, p_n$ are all the finitely many primes of the form $4k + 3$. Then *consider* $M = (p_1 p_2 p_3 \cdots p_n)^2 + 2$.

i) Argue that M is of the form $4k + 3$.

ii) Argue that none of the primes p_i divides M.

iii) Complete the proof by arriving at a contradiction.

Problem 2. Prove that there are infinitely many primes of the form $3k + 2$.

Problem 3. i) Compute $g := GCD(561, 25)$ using Euclid's algorithm.

ii) Compute integers x and y so that $561x + 25y = g$.

Reading Exercise. Read Section 1.1 from Hammack's book.

Additionally, turn in (the solutions to) the following problems from Hammack's book.

Sec.1.1: 16, 22, 28

Sec.1.2: 18, 20