Number Theory and Cryptography
Homework 6 (due 3/21)

1. Consider the prime $p = 1637$.
i. Check that $a = 316$ is a square root of -1 mod p.
ii. Using part i. and the algorithm explained in class, find two integers x, y such that $x^2 + y^2 = 1637$. *Show your work!!!*

2. Using quadratic reciprocity, determine whether or not 46 is a square mod 197.

3. For which primes $p \nmid 6$ is 6 a square mod p? Your answer should be a congruence condition on p.