Number Theory and Cryptography
Homework 6 (due 4/1)

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 on March 28, 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 $p$. 