HOMEWORK 5

DUE 21 FEBRUARY 2012

Determine whether the integer A is a quadratic residue or nonresidue modulo p for the following integers.

1. $A = 500, p = 4219$.

2. $A = 2003, p = 2011$.

3. $A = 1903, p = 2011$.

4. Let p and q be distinct odd primes. Set $p^* = (-1)^{\frac{p-1}{2}} p$. Prove that

$$\left(\frac{p^*}{q}\right) = 1 \iff p \equiv \pm a^2 \pmod{4q} \text{ for some } \textit{odd} \text{ integer } a.$$