Homework 14, due October 23

(1) Evaluate the Jacobi symbol

$$\left(\frac{24601}{365235}\right),$$

showing each step, and explain what the answer means.

(2) For the numbers $n = 1, 5, 7, 11$, do the following: Suppose that p is a prime congruent to $n \pmod{12}$, and determine whether 3 is a square modulo p.

(3) Test 118901521 for primality using the Fermat test for several values of a. Is 118901521 prime?

(4) Test 104173 for primality using the Solovay-Strassen test. Use enough values of a to be 99 percent sure that it is prime. (Recall from class that if a number is composite, the test will tell you so for at least half of the possible a.)