1. Alice and Bob use the Massey-Omura cipher with common modulus $p = 2591$. Alice’s secret enciphering exponent is $e_A = 107$; Bob’s is $e_B = 257$. Compute the deciphering exponents and show the numbers passed between them when Alice sends Bob the plaintext $M = 1234$. Show your work.

2. Find the smallest positive quadratic nonresidue modulo 71. Show your work.

3. Show your work as you answer these questions. [Hint: Use Euler’s Criterion.]
   a. Is 2 a quadratic residue modulo 41?
   b. Is 2 a quadratic residue modulo 43?