1. What is the plaintext message that corresponds to the following ciphertext

   1212  0902  0539  1208  1234  1103  1374

   using modular exponentiation with \( p = 2591 \) and \( e = 13 \)?

2. Using the modular exponentiation with the prime \( p = 8999 \) and enciphering key \( e = 5 \), encipher the following message

   \[ LI\ FE\ IS\ ME\ AN\ IN\ GL\ ES\ S.\]

   (Please use the same Letter-Number correspondence given in the lecture (i.e. \( A = 11, \ldots, Z = 36 \)), and you may use a computer.)

3. Find the primes \( p \) and \( q \) satisfying \( n = pq = 4386607 \) and \( \phi(n) = 4382136 \).

4. If the ciphertext message produced by the RSA cipher with the public key \((n, e) = (2881, 5)\) is

   \[ 0504\ 1874\ 0347\ 0515\ 2088\ 2356\ 0736\ 0468,\]

   what is the plaintext message?

5. Using the RSA cipher with the public key \((n, e) = (10088821, 5)\), encipher the following message

   \[ LET\ USG\ OTO\ LAL\ ALA\ ND.\]

   (Please use the same Letter-Number correspondence given in the lecture (i.e. \( A = 11, \ldots, Z = 36 \)), and you may use a computer.)