1. Determine which of the following Gaussian integers are Gaussian primes:
   a. $1 + 3i$
   b. $3 + 4i$
   c. $14 - 5i$

2. If $p$ is an odd, number when is $p + i$ a Gaussian prime?

3. Use the Euclidean division algorithm to find a quotient and remainder when $a$ is divided by $b$:
   a. $a = 1 + 3i, b = 1 + i$
   b. $a = 14 - 5i, b = 2 + 3i$
   c. $a = 11 - 3i, b = 3 + i$

4. Find a GCD of each of the two numbers given in Question 3. Then write the GCD as a linear combination of the two numbers.

5. Give an example of a pair of Gaussian integers with at least two GCDs.

6. Why are the two factorizations $10 = (1 - 3i)(1 + 3i) = (3 - i)(3 + i)$ not contradictions to the unique factorization theorem? What about $5 = (1 - 2i)(1 + 2i) = (2 - i)(2 + i)$?

7. If $u$ is a unit, $w$ a Gaussian integer, and $z$ is a Gaussian prime and $z | uw$, show that $z | w$.

8. Prove that if $z$ is a Gaussian prime then the norm of $z$ is an integer prime or the square of an integer prime.

9. Prove that if a Gaussian integer is prime, then so is its complex conjugate.

10. Suppose $p$ is an integer prime but not a Gaussian prime. Show that $p = a \cdot \overline{a}$ where $a$ is some Gaussian prime.