(1) Prove that $\phi(p^2) = p(p - 1)$.
(2) Show that $e^2 - 2f^2 \not\equiv 3, 5 \text{ mod } 8$.
(3) Find a primitive root modulo 13.
(4) Define unit, prime, irreducible, order of an element.
(5) Prove that $\gcd(a, b) = \gcd(a, a + b)$.
(6) Show that there are infinitely many primes $\equiv 2 \text{ mod } 3$.
(7) Prove Fermat’s Little Theorem
(8) Compute $\gcd(3 + 4i, 6 + 6i)$.
(9) Is $X^3 + x + 1$ a quadratic residue modulo $X^2 + 1$ in $F_7$?