

This thesis studies the Solovay-Strassen test for primality of an integer  $n$ , which is based on the Jacobi symbol. After formulating the basic algorithm, we compute the probability that the number  $n$  being tested is really a prime number if the Solovay-Strassen test declared it so. We further improve the computation of the probability under the assumption that  $n$  is not divisible by specific small primes, which can be easily verified. Finally, we construct a new test, as an analogy of the Solovay-Strassen test, based on the quartic residue symbol.