

Abstract: We present an algorithm for determining whether an ideal in a polynomial ring is prime or not. We use the Gröbner bases as a main tool for operations with ideals. We show an analogue of Buchberger's algorithm for computing a Gröbner basis for an ideal in polynomials over a ring, which not need to be a field. We also show a relation between prime ideals in polynomials over a ring  $R$  and prime ideals in polynomials over a quotient ring of  $R$  modulo a prime ideal. We are primarily discussing the issues of theoretical correctness, but we also present the conditions of actual computability.