Notes of "Polynomials"

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1 一元多项式

Definition 1 (数域 P 上的一元多项式)**.**

Definition 2 (一元多项式相等及零多项式)**.**

Definition 3 (数域 P 上的一元多项式环)**.**

2 整除的概念

Proposition 1 (带余除法的成立)**.**

$$f(x) = q(x)g(x) + r(x) \tag{1}$$

q(x) and r(x) are uniquely determined. r(x) = 0 or $\deg(r(x)) < \deg(g(x))$*.*

Definition 4 (整除)**.**

Properties of Divisors:

- 对偶等价于相差常数倍

- 传递性

- 整除组合

3 最大公因式

Definition 5 (Common Divisor and Greatest Common Divisor)**.**

Lemma 1 (Common Divisors in Euclidean Division)**.** *f(x) and g(x), g(x) and r(x) have the same common divisors.*

Theorem 1 (Theorem of Polynomial Greatest Common Divisor)**.**

Example 1 (Euclid's Algorithm)**.**