2.5 Univariate Polynomial Rings

Let R be a ring and $a \in R[x]$.

Let $a = a_n x^n + a_{n-1} x^{n-1} + \cdots + a_1 x + a_0$ with $a_n \neq 0$.

	Math	Maple
n is the degree of a w.r.t. x	$\deg a$	degree(a,x)
a_n is the leading coefficient	$\mathrm{lc}\ a$	lcoeff(a,x)
x^n is the leading monomial	$\mathrm{lm}\ a$	lcoeff(a,x,'m')
$a_n x^n$ is the leading term	$\mathrm{lt}\ a$	—

NB $\mathrm{lc}(0) = \mathrm{lt}(0) = 0$, $\mathrm{lm}(0) = 1$, $\deg(0) = -\infty$

Theorem. If D is an integral domain and $a, b \in D[x]$ are non-zero polynomials then

(i) $\deg(ab) =$
(ii) $\mathrm{lc}(ab) =$
(iii) $\mathrm{lm}(ab) =$
(iv) $\mathrm{lt}(ab) = \mathrm{lt}(a)\,\mathrm{lt}(b)$