opposite polynomial*

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2013-03-21 18:15:44

The *opposite polynomial* of a polynomial P in a polynomial ring $R[X]$ is a polynomial $-P$ such that

$$P+(-P) \;=\; \mathbf{0},$$

where $\mathbf{0}$ denotes the zero polynomial. It is clear that $-P$ is obtained by changing the signs of all of the coefficients of P, i.e.

$$-\sum_{\nu=0}^{n} a_\nu X^\nu \;=\; \sum_{\nu=0}^{n}(-a_\nu)X^\nu.$$

The opposite polynomial may be used to define subtraction of polynomials:

$$P-Q \;=:\; P+(-Q)$$

Forming the opposite polynomial is a linear mapping $R[X] \to R[X]$.

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*⟨*OppositePolynomial*⟩ created: ⟨*2013-03-21*⟩ by: ⟨*pahio*⟩ version: ⟨*36447*⟩ Privacy setting: ⟨*1*⟩ ⟨*Definition*⟩ ⟨*11C08*⟩ ⟨*12E05*⟩ ⟨*13P05*⟩