Clasa a XII-a C

Polinoame

Șiruri de elemente

$- K = \text{corp} (\mathbb{L}; \mathbb{Q}; \mathbb{R}; \mathbb{C})$

$f = (a_0, a_1, a_2, \ldots, a_n, 0, \ldots, 0)$

$x^0 \quad x^1 \quad x^2 \quad \ldots \quad x^n$

coeficienți ai lui x

ex: $f = (1, 2, 0, 0, 5, 0, 0, \ldots, 0, \ldots)$

$x^0 \quad x^1 \quad x^2 \quad x^3 \quad x^4$

$$f = 1 \cdot x^0 + 2 \cdot x^1 + 0 \cdot x^2 + 0 \cdot x^3 + 5x^4$$

$$f = 1 + 2x + 5x^4 \implies f = 5x^4 + 2x + 1$$

forma algebrică a polinomului f

$$f = a_0 x^0 + a_1 x^1 + a_2 x^2 + \dots + a_n x^n$$

$$f = a_0 + a_1 x + a_2 x^2 + \dots + a_n x^n$$

$$f = a_n \cdot x^n + a_{n-1} \cdot x^{n-1} + \ldots + a_1 \cdot x + a_0$$

1. Gradul polinomului = puterea cea mai mare a lui x — exponentul

$$\boxed{grad \ f = n}$$

ex: $f = (1, 2, 0, 3, 1, 0, 0, \ldots, 0)_3$

$f = 1 \cdot x^0 + 2 \cdot x^1 + 0 \cdot x^2 + 3 \cdot x^3 + 1 \cdot x^4$

$f = 1 + 2x + 3x^3 + x^4 \iff \boxed{grad \ f = 4}$

$f = x^4 + 3x^3 + 2x + 1$

2. TERMENI : $a_n x^n, a_{n-1} x^{n-1}, \ldots, a_1 x, a_0$

$(a_0 = \text{termen liber})$

3. COEFICIENTI ; $a_n, a_{n-1}, a_{n-2}, \ldots, a_1, a_0)$

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a) $f = (\underset{x^0}{1}, \underset{x^1}{0}, \underset{x^2}{1}, \underset{x^3}{2}, \underset{x^4}{3}, \underset{x^5}{-1}, 0, 0, \ldots, 0)$

$f = 1 \cdot x^0 + 0 \cdot x^1 + 1 \cdot x^2 + 2x^3 + 3x^4 + (-1) \cdot x^5$

$f = 1 + x^2 + 2x^3 + 3x^4 - x^5$

$f = -x^5 + 3x^4 + 2x^3 + x^2 + 1$ / grad $f = 5$

[E2] $m \in \mathbb{R}$, $f \in \mathbb{R}[X]$; $\operatorname{grad} f = ?$

b) $f = 2 + (m^2 - 1) \cdot x + (m^2 - 3m + 2) \cdot x^2$

$$f = (m^2 - 3m + 2) x^2 + (m^2 - 1) \cdot x + 2$$

$m^2 - 3m + 2 = 0$

$a = 1$
$b = -3$
$c = 2$

$\Delta = 9 - 8 \Rightarrow \Delta = 1$

$m_{1,2} = \dfrac{3 \pm 1}{2} \Rightarrow$

$m_1 = 1$
$m_2 = 2$

Cazi: $m = 1 \Rightarrow f = 0 x^2 + 0 \cdot x + 2 \Rightarrow$

$\Rightarrow f = 2 \Rightarrow \text{grad } f = 0$

$(x^0 = 1)$

$2 = \text{termen liber}$

$(2 = 2 x^0)$

Caz II: $m = 2 \Rightarrow f = 0 \cdot x^2 + 3x + 2 \Rightarrow$

$\Rightarrow f = 3x + 2 \Rightarrow \text{grad } f = 1$

$\Rightarrow$

Caz III: $m \in \mathbb{R} \setminus \{1, 2\} \Rightarrow \text{grad } f = 2$

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