

Împărțirea polinoamelor

$$\begin{array}{r} 17 \overline{) 15} \\ \underline{-15} \\ 2 \end{array}$$

$$17 = 5 \cdot 3 + 2$$

$$0 \leq 2 < 5$$

$$D: \hat{I} = C, \text{ rest } R$$

$$D = \hat{I} \cdot C + R$$

$$0 \leq R < \hat{I}$$

$$f, g \in K[x];$$

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

$$g = x^2 + x + 1$$

$$x^3 - 3x^2 + 4x + 2$$

$$\underline{-x^3 - x^2 - x}$$

$$-4x^2 + 5x + 2$$

$$\underline{+4x^2 + 4x + 4}$$

$$f : g = q, \text{ rest } r$$

$$f = g \cdot q + r$$

$$0 \leq \text{grad } r < \text{grad } g$$

$$x^2 + x + 1$$

$$\underline{-x - 4}$$

$$q = x - 4$$

$$r = 7x + 6$$

$$x^3 - 3x^2 + 4x + 2 =$$

$$= (x^2 + x + 1) \cdot (x - 4) + 7x + 6$$

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a) $f = x^3 + x + 1$; $g = x - 1$

$$\begin{aligned} x^3 + x + 1 &= (x-1) \cdot (x^2 + x + 2) + 3 = \\ &= x^3 + x^2 + 2x - x^2 - x - 2 + 3 = \\ &= x^3 + x + 1 \end{aligned}$$

$$\begin{array}{r} x^3 + x + 1 \\ -x^3 + x^2 \\ \hline x^2 + x + 1 \\ -x^2 + x \\ \hline 2x + 1 \\ -2x + 2 \\ \hline 3 \end{array}$$

$$\begin{array}{r} x-1 \\ \hline x^2 + x + 2 \end{array}$$

$$q = x^2 + x + 2$$
$$r = 3$$

$$b) \quad \begin{array}{r} x^4 + 2x^3 + x + 2 \\ -x^4 - x^3 - x \\ \hline \end{array}$$

$$\begin{array}{r} x^3 - x^2 + x + 2 \\ -x^3 - x^2 - x \\ \hline \end{array}$$

$$\begin{array}{r} -2x^2 + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 2x^2 + 2x + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 2x + 4 \\ \hline \end{array}$$

$$\begin{array}{r} x^2 + x + 1 \\ x^2 + x - 2 \\ \hline \end{array}$$

$$g = x^2 + x - 2$$

$$r = 2x + 4$$

$$x^2 \cdot x^2 = x^4$$

$$d) \begin{array}{r} x^5 + x^4 + x^2 + 1 \\ -x^5 - x^3 \end{array}$$

$$\hline x^4 - x^3 + x^2 + 1 \\ -x^4 - x^2$$

$$\hline -x^3 + 1 \\ x^3 + x$$

$$\hline x + 1$$

$$\begin{array}{r} x^2 + 1 \\ \hline x^3 + x^2 - x \end{array}$$

$$g = x^3 + x^2 - x$$

$$v = x + 1$$