Împărțirea polinoamelor

17 | 5
15 | 3
2

$17 = 5 \cdot 3 + 2$

$0 \leq 2 < 5$

D: Î = C, rest + R

$D = Î \cdot C + R$

$0 \leq R < Î$

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

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

$g = X^2 + X + 1$

$X^3 - 3X^2 + 4X + 2$ | $X^2 + X + 1$

$-X^3 - X^2 - X$ | $X - 4$

$-4X^2 + 3X + 2$

$+4X^2 + 4X + 4$

$7X + 6$

$q = X - 4$

$r = 7X + 6$

$f : g = q$, rest r

$f = g \cdot q + r$

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

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

$= (X^2 + X + 1) \cdot (X - 4) +$

$+ 7X + 6$

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

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

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

$= x^3 + x + 1$

$x^3 + x + 1 \;|\; x - 1$

$-x^3 + x^2 \qquad\qquad x^2 + x + 2$

$x^2 + x + 1$

$-x^2 + x$

$2x + 1$

$-2x + 2$

3

$g = x^2 + x + 2$

$r = 3$

b) $x^4 + 2x^3 + x + 2$ | $x^2 + x + 1$

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

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

$-x^3 - x^2 - x$

$-2x^2 + 2$

$2x^2 + 2x + 2$

$2x + 4$

$q = x^2 + x - 2$

$s = 2x + 4$

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

d) $x^5 + x^4 + x^2 + 1$

$-x^5 - x^3$

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

$-x^4 - x^2$

$-x^3 + 1$

$x^3 + x$

$x + 1$

$x^2 + 1$

$x^3 + x^2 - x$

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

$r = x + 1$