Împărțirea polinoamelor

pag 118 (manual)

(E1) e) $x^4 + ix^2 + x + i \mid x + 1$

Quotient: $x^3 - x^2 + x(1+i) - i$

$$
\begin{array}{l}
x^4 + ix^2 + x + i \\
-x^4 - x^3 \\
\hline
/\ -x^3 + ix^2 + x + i \\
x^3 + x^2 \\
\hline
/\ x^2(1+i) + x + i \\
-x^2(1+i) - x(1+i) \\
\hline
/\ -i\cdot x + i \\
+ix + i \\
\hline
/\ 2i
\end{array}
$$

$x^2 + ix^2 = x^2(1+i)$

$x - x(1+i) = x(1-1-i) = x\cdot(-i) = -i\cdot x$

$q = x^3 - x^2 + x(1+i) - i$

$r = 2i$

f) $x^4 + (1+i)x^3 - ix + 1$ | $x^2 + (1+i)x - i$

$-x^4 - ix^2$ ——— $x^2 + i$

$(1+i)x^3 - ix^2 - ix + 1$

$-(1+i)x^3 - (i-1)x$

$-ix^2 - (i-1)x - i + 1$

$ix^2 + 1$

$-(i-1)x - i + 2$

$(-i+1)x - i + 2$

$(1-i)x - i + 2$

$i(1+i) \cdot x =$

$= (i + i^2)x =$

$= (i-1)x$

$-i^2 = -(-1) = 1$

$Q = x^2 + (1+i)x - i$

$R = (1-i)x - i + 2$

E2/118

$f = x^3 + x^2 + \hat{1}$; $g = x + \hat{2}$; $\mathbb{Z}_3 = \{\hat{0}, \hat{1}, \hat{2}\}$

$$x^3 + x^2 + \hat{1} \;\big|\; x + \hat{2}$$

$$\hat{2}x^3 + x^2 \qquad x^2 + \hat{2}x + \hat{2}$$

$$/ \; \hat{2}x^2 + \hat{1}$$

$$x^2 + \hat{2}x$$

$$/ \; \hat{2}x + \hat{1}$$

$$x + \hat{2}$$

$$/ \quad /$$

$$q = x^2 + \hat{2}x + \hat{2}$$

$$r = \hat{0}$$

$\hat{1}$; $3/3$, $4/3$ ...

$(\hat{1}_{,3}) + \hat{4} = \hat{1}$

$\hat{1} = \{1, 4, 7, 10, \ldots\}$; $\hat{2} = \{5, 8, 11, 14, \ldots\}$

$$-x^3 = -\hat{1} \cdot x^3 = (\hat{0} - \hat{1})x^3 = (\hat{3} - \hat{1})x^3 = \hat{2}x^3$$

$$\hat{2}x^2 = (\hat{0} - \hat{2})x^2$$

$$(\hat{3} - \hat{2}) \; x^2 = x^2$$

$$-\hat{2}x^2 = \hat{1} \cdot x^2$$

$$\hat{1}x = (\hat{3} - \hat{1})x$$