12.03.2021
NACHMITTAG

singular

$2x2$ ✓

$2*x\hat{}2$ ✓

$2x\hat{}2$ ✗

~~xi~~

$x\hat{}i$

mathematik

$2x^2$

$2x^2$

$(2x)^2$

$f = x^{14} - x^{13} + x^{12} + x^{11} - x^{10} + x^9 + x^5 - x^4 + x^3 + x^2 - x + 1$
$\in \mathbb{F}_3[x]$

Zahl Irreduzibler Faktore: $\dim_{\mathbb{F}_3} \ker(Q - I) = 1$

Satz 4.5 $g = \gcd(f, f') = x^{13} + x^{12} + x^{10} + x^9 + x^4 + x^3 + x + 1$

$\frac{f}{g} = x + 1$ $\left(\Rightarrow f = (x+1)^{14} \right)$

$h = \gcd(g, g') = x^{12} + x^9 + x^3 + 1$ $\quad \frac{g}{h} = x + 1$

$h' = 12x^{11} + 9x^8 + 3x^2 = 0$ } 3. Fall im Satz 4.5

$\gcd(h, h') = \gcd(h, 0) = h$ }

$h = (x^4 + x^3 + x + 1)^3$

$k = x^4 + x^3 + x + 1$, $l = \gcd(k, k') = x^3 + 1$ $\quad \frac{k}{l} = x + 1$

$l' = 0 \Rightarrow l = x^3 + 1 = (x+1)^3$

A Ring mit Char $p > 0$.

$(a+b)^p = a^p + b^p$

Fr_A ist additiv

$\ell = (x+1)^3 \qquad \frac{k}{\ell} = x+1 \implies k = (x+1)^4$

$h = k^3 = ((x+1)^4)^3 = (x+1)^{12} \qquad \frac{g}{h} = x+1$

$g = (x+1)^{12}(x+1) = (x+1)^{13} \qquad \frac{f}{g} = x+1$

$f = (x+1)^{13}(x+1) = (x+1)^{14}$

Man sehe Beispiel 4.6

Aufgabe 3.3.3

$$f = 5x^{39} + 7x^{26} - 3 \in \mathbb{F}_{13}[x]$$

$$f' = 0$$

$\forall a \in \mathbb{F}_p \quad a^p = a$

$$f = 5^{13}x^{39} + 7^{13}x^{26} - 3^{13}$$

$$= (5x^3)^{13} + (7x^2)^{13} - 3^{13}$$

$$= (5x^3 + 7x^2 - 3)^{13}$$

- Aufgabe §4.3

Aufgabe 3.3.3.

- §5

Aufgabe 5.0.10