$$ax^2+bxy+cy^2+dx+ey+f=z$$
$$z=z(x,y)$$

$\mathbb{R}$ $\quad \mathbb{R}\oplus\mathbb{R}=\mathbb{C}$ $\qquad i^2=-1$, $(a+bi)(d+ie)=\ldots$

$\mathbb{R}\oplus\mathbb{R}\oplus\mathbb{R}\oplus\mathbb{R}=\mathbb{C}\oplus\mathbb{C}$ $\qquad j^2=-1$

$z+jw\in\mathbb{C}\oplus\mathbb{C}=\mathbb{H}$

$i\cdot j=-j\cdot i$

$\mathbb{R}^8=\mathbb{H}\oplus\mathbb{H}$

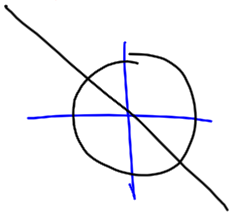
3 5-18:05

0 -- nulový polynom

1 -- konstantní polynom 1

$$(\overset{\neq 0}{a_k}x^k+\text{LOTs})\cdot(\overset{\neq 0}{b_\ell}x^\ell+\text{LOTs})$$
$$=\underbrace{a_k\cdot b_\ell}_{\neq 0}x^{k+\ell}+\text{LOTs}\quad\neq 0$$

$$(x^2+y^2-1)\cdot(x+y)=0$$



3 5-18:32

$a\cdot h=b \quad b\cdot h'=c \Rightarrow a\cdot(h\cdot h')=c$

$a|c,\ a|b \Rightarrow \alpha\cdot a\cdot h+\beta\cdot a\cdot h'$
$=a(\alpha\cdot h+\beta\cdot h')$

e jednotka $\quad a=e\cdot(e^{-1}a)$

3 5-18:38

$$x^{\frac{m_i}{2^{n_i}}}\cdot x^{\frac{m_j}{2^{n_j}}}=x^{\frac{2^{n_j-n_i}m_i+m_j}{2^{n_j}}},\ n_j>n_i$$

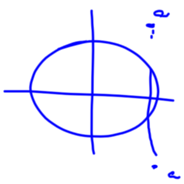
$$(a_kx^k+\ldots):(b_\ell x^\ell+\ldots)$$

$f,g:\mathbb{K}\to\mathbb{K}$ $\quad \mathbb{K}$ pole

$(f-g)(a)=0 \quad \forall a\in\mathbb{K}$

3 5-18:49

$$(x-a)\cdot(x-\bar a)=x^2-ax-\bar a x+|a|^2$$
$$=x^2-(a+\bar a)x+|a|^2$$
$$=x^2-2\operatorname{Re}a\,x+|a|^2$$



3 5-19:17

$f\in\mathbb{C}[z]$, $f\neq 0$, $\boxed{f(z)\neq 0}$ $\forall z\in\mathbb{C}$

$\varphi:\mathbb{C}\to\mathbb{C}$, $z\xmapsto{\varphi}\dfrac{f(z)}{|f(z)|}$

$\varphi:\mathbb{C}\to K_1=\{e^{it},\ t\in\mathbb{R}\}$

$\psi_r:\mathbb{R}\to K_r$, $t\mapsto\psi(t)=re^{it}$

$\forall r\in(0,\infty)$ $\quad \kappa_r=\varphi\circ\psi_r:\mathbb{R}\to K_1$

$\Rightarrow \exists\ \alpha_r:\mathbb{R}\to\mathbb{R}$ jednoznačně $\quad 0\le\alpha_r(0)<2\pi$

$\boxed{\kappa_r(t)=e^{i\alpha_r(t)}}$ $\qquad \frac{1}{2\pi}(\alpha_r(2\pi)-\alpha_r(0))=$
$=n_r\in\mathbb{Z}$

$$\underset{t}{\alpha:\mathbb{R}}\times\underset{r}{(0,\infty)}\to\underset{\alpha_r(t)}{\mathbb{R}}$$

3 5-19:22

$f = a_0 + \dots + a_d z^d \quad a_d \neq 0 \quad n_r = 0$

r malé $\Rightarrow$ α_r se chová jako a_0

r velké $\Rightarrow$ α_r se chová jako z^d $\leftarrow n_r = d$

$z \xmapsto{\varphi} \frac{z^d}{|z^d|}$ $\quad z = r(\cos\alpha + i\sin\alpha)$

$z^d = r^d(\cos d\alpha + i\sin d\alpha)$

3 5-19:32

$$x^2 + xy + y^2 = \underbrace{\underbrace{1}_{a_2}\cdot x^2 + \underbrace{y}_{a_1}\cdot x + \underbrace{y^2}_{a_0}}_{\in \mathbb{Z}[y][x]}$$

3 5-19:38