TVINNFALLAGREINING I- FORMÚLUBLAÐ

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Hornaföll

$\cos(\theta) = \dfrac{e^{i\theta} + e^{-i\theta}}{2}$

$\sin(\theta) = \dfrac{e^{i\theta} - e^{-i\theta}}{2i}$

$\sin^2(\theta) + \cos^2(\theta) = 1$

$(\cos(\theta) + \sin(\theta))^n = \cos(n\theta) + i\sin(n\theta)$

$\overline{\frac{\partial f}{\partial z}} = \frac{\partial \overline{f}}{\partial \overline{z}}$

$\overline{\frac{\partial f}{\partial \overline{z}}} = \frac{\partial \overline{f}}{\partial z}$

Höfuðgrein hornsins:

$$\text{Arg } z = 2\arctan\left(\frac{y}{|z| + x}\right), \qquad \text{Arg} : \mathbb{C} \setminus R_- \to]-\pi, \pi[.$$

Höfuðgrein lografallsins:

$$\text{Log} z = \ln|z| + i\text{Arg}(z), \qquad \text{Log} : \mathbb{C} \setminus \mathbb{R}_- \to \mathbb{C}.$$

$$\cos(z) = \frac{e^{iz} + e^{-iz}}{2}$$

$$\sin(z) = \frac{e^{iz} - e^{-iz}}{2i}$$

$$\text{Vegheildi: } \int_C f dz = \int_\gamma f dz = \int_\gamma f dx + i f dy = \int_a^b f(\gamma(t))\gamma'(t) dt$$

$$\int_C f d\bar{z} = \int_\gamma f d\bar{z} = \int_\gamma f dx - i f dy = \int_a^b f(\gamma(t))\overline{\gamma'(t)} dt$$

$$\left| \int_C f(z)\ dz \right| \le \int_\gamma |f(z)|\,|dz| \le \max_{z\in C} |f(z)| \int_\gamma |dz| = \max_{z\in C} |f(z)|\, L(C)$$

$$f(z) = \sum_{n=0}^{\infty} c_n (z-a)^n, \qquad c_n = \frac{1}{2\pi i} \int_{\partial D(a,r)} \frac{f(\zeta)}{(\zeta - z)^{n+1}} \partial\zeta$$

$$f^{(n)}(z) = \frac{n!}{2\pi i} \int_{\partial\Omega} \frac{f(\zeta)}{(\zeta - z)^{n+1}} \partial\zeta$$

$$\int_{\partial\Omega} f(z)\, dz = 2\pi i \sum_{\alpha \in \omega \cap A} \text{Res}(f, \alpha)$$

Leif í m-ta stigs skauti:

$$\text{Res}(f, \alpha) = \frac{g^{(m-1)}(\alpha)}{(m-1)!}$$

Stofnbrotaliðun:

$$\frac{P(z)}{Q(z)} = \sum_{j=1}^{k} \frac{A_{j,0}}{(z-\alpha_j)^{m_j}} + \cdots + \frac{A_{j,m_j-1}}{(z-\alpha_j)}, \quad A_{j,\ell} = \frac{f_j^{(\ell)}(\alpha_j)}{\ell!}, \quad f_j(z) = \frac{(z-\alpha_j)^{m_j} P(z)}{Q(z)}$$

$$I(\xi, z) f(z) = \frac{1}{2\pi i} \int_\xi \frac{f(\zeta)}{\zeta - z} \partial\zeta$$

$$I(\xi, z) f^{(n)}(z) = \frac{n!}{2\pi i} \int_\xi \frac{f(\zeta)}{(\zeta - z)^{n+1}} \partial\zeta$$

$$\int_{\xi} f(\zeta)\, d\zeta = 2\pi i \sum_{\alpha \in I(\xi) \cap A} \operatorname{Res}(f, \alpha) I(\xi, \alpha)$$

$$\sum_{\alpha \in I(\xi)} \omega(f, \alpha) I(\xi, \alpha) = \frac{1}{2\pi i} \int_{\xi} \frac{f'(z)}{f(z)} dz = \frac{1}{2\pi i} \int_{f_* \xi} \frac{dw}{w} = I(f_* \xi, 0)$$