# 1. New

### Intergal of power series

Then, holds:

$$\cdot \int_{|z-z_0|=r} (z-z_0)^n dz = \begin{pmatrix} 0 & n \neq 1 \\ 2\pi i & n = -1 \end{pmatrix}$$

Demonstration:

n$\geq 0$ :

$\frac{(z-z_0)^{n+1}}{n} \in \int (z-z_0)^n$

$\frac{(z-z_0)^{n+1}}{n} \in \mathcal{H}(\mathcal{C})$

CFT over closed curve:

$$\int_{|z-z_0|=r} (z-z_0)^n dz = 0$$

n$\leq -1$ :

$\frac{(z-z_0)^{n+1}}{n} \in \int (z-z_0)^n$

$\frac{(z-z_0)^{n+1}}{n} \in \mathcal{H}(\mathcal{C} \setminus z_0)$

CFT over closed curve:

$$\int_{|z-z_0|=r} (z-z_0)^n dz = 0$$

$n = -1$

$log(z-z_0) \in \int (z-z_0)^n$etermination