

Cauchy Integral Formula

$$\oint_C \frac{f(z)}{z-z_0} dz = 2\pi i f(z_0)$$


$$\oint_C \frac{f(z)}{(z-z_0)^{n+1}} dz = \frac{2\pi i}{n!} f^{(n)}(z_0)$$

Cauchy Residue Theorem

residue of $f(z)$ at $z=a$ is $\frac{1}{n!} \lim_{z \rightarrow a} \frac{d^n}{dz^n} \{ (z-a)^n f(z) \}$ (for pole of order n)

CRT $\rightarrow \oint_C f(z) dz = 2\pi i \{ R_1 + R_2 + R_3 + \dots \}$

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