THE MISTAKES BY CAUCHY

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For the zeta function [1] we have

$$A := \int_C dx \frac{x^{s-1}}{e^x - 1}$$

analytic in the whole complex plain, but for $s > 1$

$$A = \int_0^\infty dx \frac{x^{s-1} - (e^{2\pi i} x)^{s-1}}{e^x - 1}$$

for great n

$$|A^{(n)}(s)| > |C' \int_0^1 dx \ln^n x (x^{s-1} - (e^{2\pi i} x)^{s-1})/x| > C|1 - e^{2(s-1)\pi i}|n!/|(s-1)^n|, C > 0.1$$

This means it has convergent radium $|s-1|$. Use this function we can easily to deny the Cauchy's theorem. The proof mistakes in that: we should make double limit of partitions P_i and integral circles C_i,

$$\lim_{C_i} \lim_{P_j} A_{ij}$$

to ensure the limit of the addition of four things:

1)the linear integration of circle and its error

2)the integration of area between two circles and its error.

At last we find the proof is inaccessible. because these means the limit is

$$\lim_{P_{j(k,i)}} \lim_{C_i} A_{ij}$$

j is function of k, i. So that it's conformal double limit.

References

[1] H. M. Edwards (1974). Riemann's Zeta Function. Academic Press. ISBN 0-486-41740-9.

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