THE MISTAKES BY CAUCHY

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Abstract. Discuss on the logics of Cauchy's theorem and conformal limit.

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,

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

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.

General quantifier and Universal quantifier, these two words seem the same, but this example

$$\forall i (\lim_{n \to \infty} a_{in})$$

and

$$\forall i (\lim_{n(k,i), k \to \infty} a_{in})$$

are different. For the latter, universal quantifier means conformal limit. So that, General Quantifier: any, is denoted by

$$\forall i$$

Universal Quantifier: for all, is denoted by

$$@i$$

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The reason of this situation is that inductive or one-after-one proof can't empty the set of natural number.

References

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

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