【*Review article*】

Investigated prime numbers corresponding to nontrivial zeros of Riemann hypothesis

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【*Abstract*】

We investigated prime numbers corresponding to nontrivial zeros.
We used walframalpha which exists on the net for all calculation and drawing.
In the complex plane, the non-trivial zeros of the zeta function were thought that there were non-trivial zeros besides x = 0.5, and I examined them variously, but they did not show the tendency to converge at all and were inferred to be absent.
The zeros of the zeta function probably existed indefinitely at x = 0.5, but they were inferred to be absent elsewhere. In the walframalpha 's Parametric plot, I understood the convergence well.
The first zero point at x = 0.5 was set as T1 = 14.1347, and the corresponding prime number was obtained.
In the following, prime numbers corresponding to nontrivial zero points T2 = 21.022, T3 = 25.0108, etc. were obtained.

【*Introduction*】

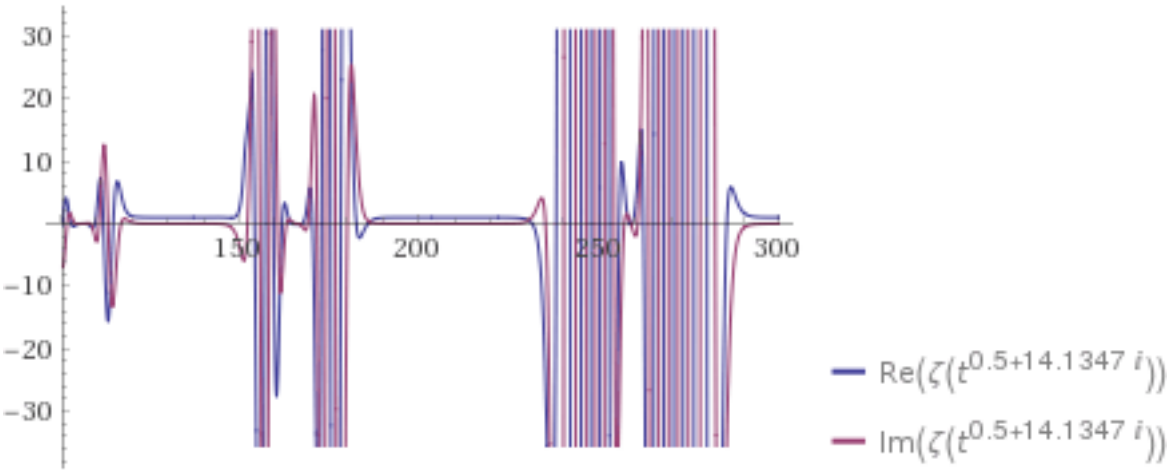
$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s} \tag{1}$$

$$\zeta(s) = \frac{2^s}{2^s - 1} \frac{3^s}{3^s - 1} \frac{5^s}{5^s - 1} \frac{7^s}{7^s - 1} \cdots\cdots \tag{2}$$

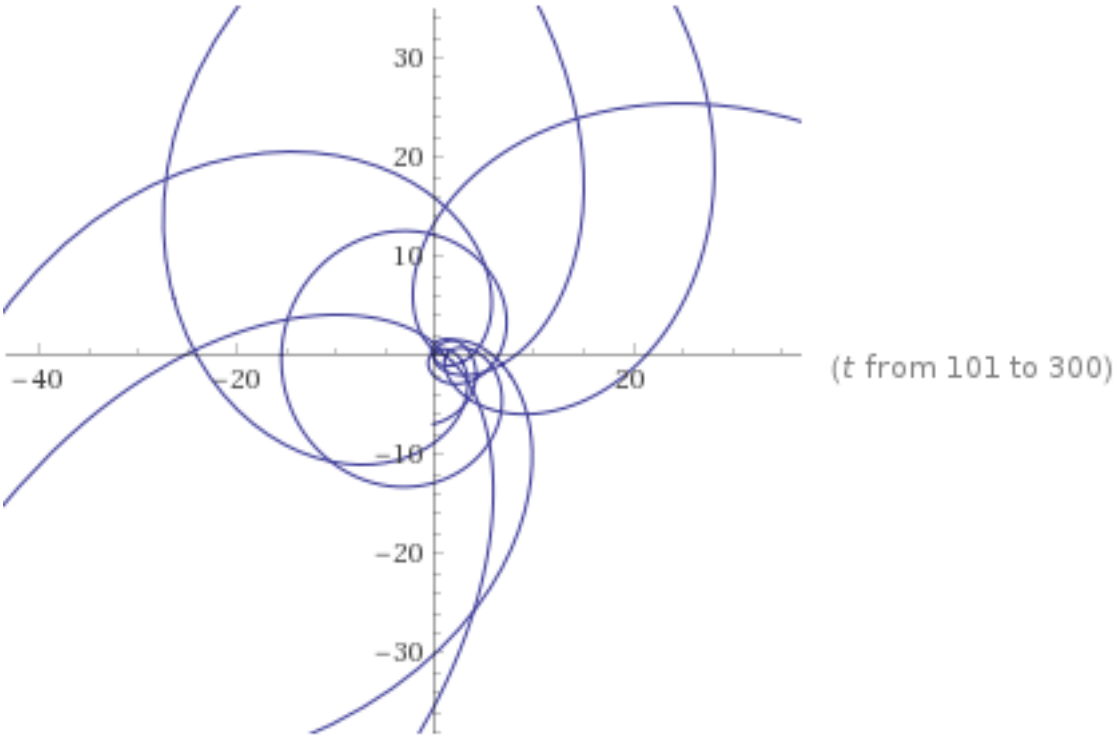
There was no one that would become a perfect zero point, only to search for the one close to the zero point. However, this seemed to be a range of error for walframalpha whose value such as T1 = 14.1347 is reflected in the calculation only to the decimal point four digits.
(Prime number) s to the power of zero (but it seems that several numbers close to zero will shrink to zero), the above formula converges to zero.
As a non-trivial zero point
T1 = 14.1347
T2 = 21.0220
T3 = 25.0108 ...
.....
.....
To any one of these nontrivial zero points, Ps power = (prime number) ^ s = (prime number) ^ (0.5 + ti) = 0 (i = imaginary number) (t = T1 or T2 or T3 or T4 ....), it was thought that it was, and calculated with wolframalpha as follows.

【*Discussion*】

Plot[{Re[Zeta[t^(0.5+i14.134725)]], Im[Zeta[t^(0.5 + i14.134725)]]},{t,101,300}]
Plot:



Parametric plot:



I did it as above and performed a point zero search.

zeta[3^(0.5+14.134725i)]
-0.00777519... - 0.0161076... i

−0.00777612... −
0.0161051... *i*

(using the principal branch of the logarithm for complex exponentiation)

zeta[17^(0.5+21.022i)]

$$-0.00168725\ldots + 0.00422886\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

zeta[23^(0.5+21.022i)]

$$-0.00426582\ldots + 0.000390879\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

zeta[31^(0.5+21.022i)]

$$-0.00279262\ldots - 0.00182197\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

zeta[23^(0.5+25.010856i)]

$$-0.00542481\ldots + 0.000903443\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

zeta[31^(0.5+25.010856i)]

$$0.00199035\ldots - 0.507631\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[37^(0.5 + i30.4249)]

$$0.000376748\ldots - 0.00374031\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[41^(0.5 + i32.9351)]

$$0.00424173\ldots - 0.0133719\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[73^(0.5 + i32.9351)]

$$-0.00544337\ldots + 0.00533338\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[107^(0.5 + i32.9351)]

0.00671072... −
0.00975244... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[43^(0.5+i37.5862)]

0.00300250... −
0.0000686345... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[71^(0.5+i37.5862)]

− 0.00377584... +
0.000244294... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[37^(0.5+i40.9187)]

0.000356135... +
0.00399719... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[43^(0.5+i40.9187)]

0.00314049... −
0.000995255... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i43.3271)]

− 0.00329615... −
0.00902419... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[19^(0.5+i48.0052)]

− 0.00246183... +
0.000545302... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i49.7738)]

$$-0.00594552\ldots + 0.0182577\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[53^(0.5+i52.9703)]

$$0.0149725\ldots - 0.000195837\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[7^(0.5+ i56.4462)]

$$0.0103638\ldots - 0.000507636\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i56.4462)]

$$-0.00467447\ldots + 0.0133697\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[91^(0.5+i56.4462)]

$$-0.0397867\ldots - 0.0000459311\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[53^(0.5+i59.347)]

$$0.00398829\ldots - 0.0000834760\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[19^(0.5+i60.8318)]

$$-0.00256410\ldots - 0.00105746\ldots\, i$$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[19^(0.5+i65.1125)]

$-0.00290438\ldots - 0.00201341\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[23^(0.5+i65.1125)]

$-0.00409631\ldots + 0.000282556\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[41^(0.5+i65.1125)]

$0.00299627\ldots - 0.00397987\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[2^(0.5+i67.0798)]

$-0.00129934\ldots - 0.0860652\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[23^(0.5+i67.0798)]

$-0.00670157\ldots + 0.00139597\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[71^(0.5+i67.0798)]

$-0.00394804\ldots - 0.00445630\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[61^(0.5+i69.5464)]

$0.00150589\ldots - 0.000642545\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[11^(0.5+i72.0672)]

0.00609060... −
0.000619707... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i72.0672)]

−0.000957110... +
0.000647963... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[7^(0.5+i75.7047)]

0.0206367... −
0.000331857... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[19^(0.5+i75.7047)]

−0.00392689... +
0.00386380... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[37^(0.5+i75.7047)]

0.000473048... +
0.00164874... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[13^(0.5+i77.1448)]

0.00350448... +
0.00160768... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[29^(0.5+i79.3374)]

−0.00469921... +
0.00245197... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[67^(0.5+i82.9104)]

0.000173911... +
0.00945142... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[71^(0.5+i84.7355)]

−0.00400509... +
0.00749742... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[103^(0.5+i84.7355)]

0.00236420... +
0.00600092... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i87.4253)]

−0.00811662... +
0.0376495... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[3^(0.5+i88.8091)]

−0.00784321... +
0.0159240... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[7^(0.5+i88.8091)]

0.00916273... +
0.000130047... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[31^(0.5+i88.8091)]

−0.00955115... +
0.00824438... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[41^(0.5+i88.8091)]

0.00260913... −
0.00240421... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[61^(0.5+i92.4919)]

0.00385385... −
0.00541860... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[3^(0.5+i94.6513)]

− 0.00150555... +
0.0285500... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[73^(0.5+i95.8706)]

0.00514231... +
0.0448668... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[89^(0.5+i95.8706)]

− 0.0126630... −
0.00293894... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[7^(0.5+i98.8312)]

0.0641562... −
0.00343108... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i98.8312)]

− 0.00715370... −
0.0247301... i

(using the principal branch of the logarithm for complex exponentiation)

Zeta[73^(0.5+i98.8312)]

$-0.00576129... + 0.00751641... i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[23^(0.5+i101.318)]

$-0.0235315... - 0.0113253... i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[79^(0.5+i101.318)]

$-0.00478849... + 0.0884729... i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[19^(0.5+i103.726)]

$-0.0179525... - 0.0909911... i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[103^(0.5+i103.726)]

$-0.00395087... + 0.0195608... i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[3^(0.5+i105.447)]

$0.00407240... - 0.0365246... i$

(using the principal branch of the logarithm for complex exponentiation)

Zeta[17^(0.5+i105.447)]

$-0.00479939... - 0.0138017... i$

(using the principal branch of the logarithm for complex exponentiation)

【*Conclusion*】

T_1=14.1347……Correspond to pimary number 3

T_2 =21.022…… Correspond to pimary number 17,23,31

T_3 =25.0108……Correspond to pimary number 23,31

T_4 =30.4248…… Correspond to pimary number 37

T_5 =32.9350…… Correspond to pimary number 41,73,107

T_6 =37.5861…… Correspond to pimary number 43,71

T_7 =40.9187…… Correspond to pimary number 37,43

T_8 =43.3270…… Correspond to pimary number 17

T_9 =48.0051…… Correspond to pimary number 19

T_{10}=49.7738…… Correspond to pimary number 17

T_{11}=52.9703…… Correspond to pimary number 53

T_{12}=56.4462…… Correspond to pimary number 7,17,91

T_{13}=59.3470…… Correspond to pimary number 53

T_{14}=60.8317…… Correspond to pimary number 19

T_{15}=65.1125…… Correspond to pimary number 19,23,41

T_{16}=67.0798…… Correspond to pimary number 2,23,71

T_{17}=69.5464…… Correspond to pimary number 61

T_{18}=72.0672…… Correspond to pimary number 11,17

T_{19}=75.7047…… Correspond to pimary number 7,19,37

T_{20}=77.1448…… Correspond to pimary number 13

T_{21}=79.3374…… Correspond to pimary number 29

T_{22}=82.9104…… Correspond to pimary number 67

T_{23}=84.7355…… Correspond to pimary number 71,103

T_{24}=87.4253…… Correspond to pimary number 17

T_{25}=88.8091…… Correspond to pimary number 3,7,31,41,61

T_{26}=92.4919…… Correspond to pimary number 61

T_{27}=94.6513…… Correspond to pimary number 3

T_{28}=95.8706…… Correspond to pimary number 73

T_{29}=98.8312…… Correspond to pimary number 7,17,73

T_{30}=101.318…… Correspond to pimary number 23,79

T_{31}=103.792…… Correspond to pimary number 19,103

T_{32}=105.447…… Correspond to pimary number 3,17

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【*References*】

1) https://en.wikipedia.org/wiki/Riemann_hypothesis

☃～☃～☃～☃～☃～

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