proposition)

$\forall\ 0<a<1$, there is b satisfing $\zeta(s)=\sum_{k=1}^{\infty}k^{-s}=0(s=a+bi)$

proof)

When $N\neq A^{B}(1<B)$ ($A,B\in\mathbb{N}$). Let define N to independent number, i-th independent number is D_i

For example, 6 is D_i , $8=2^3$ isn't an independent number.

Zeta function is

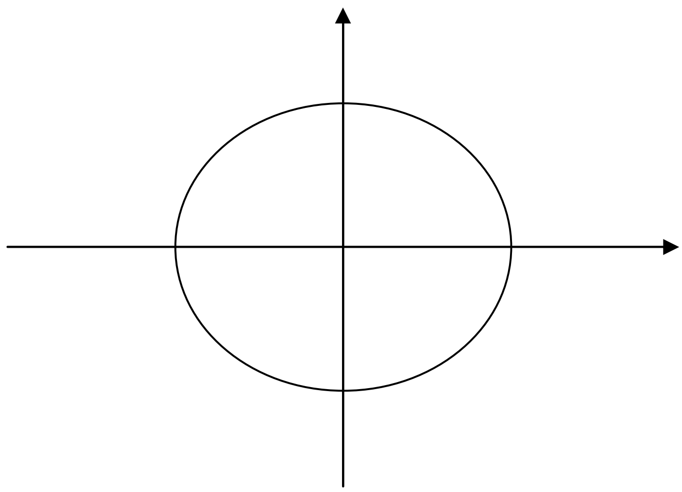
$$\zeta(s)=\sum_{k=1}^{\infty}k^{-s}=1+\sum_{i=1}^{\infty}\frac{\frac{1}{D_i^s}}{1-\frac{1}{D_i^s}}$$

and, $k^{-s}=\frac{1}{k^a}\cdot e^{\left\{-\frac{\ln n\cdot b}{2\pi}\right\}\cdot 2\pi i}$ ($\left\{-\frac{\ln n\cdot b}{2\pi}\right\}$ is decimal part of $-\frac{\ln n\cdot b}{2\pi}$)

for fixed a a, some b satisfies

if we can select $\left\{-\frac{\ln D_i\cdot b}{2\pi}\right\}\in[0,1)$

possible $\frac{1}{D_i^s}$'s trace is



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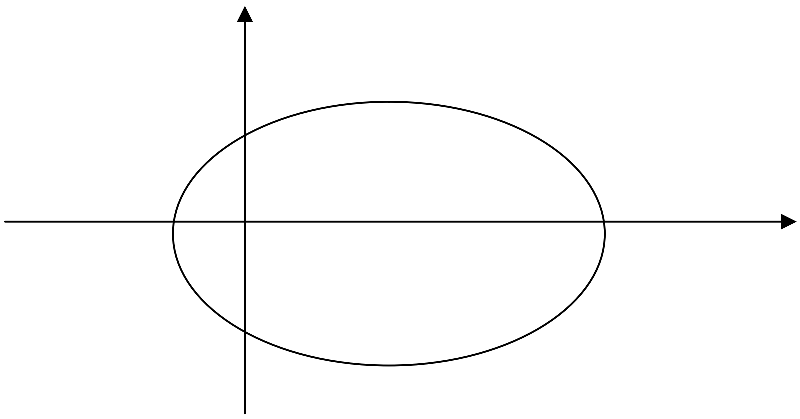
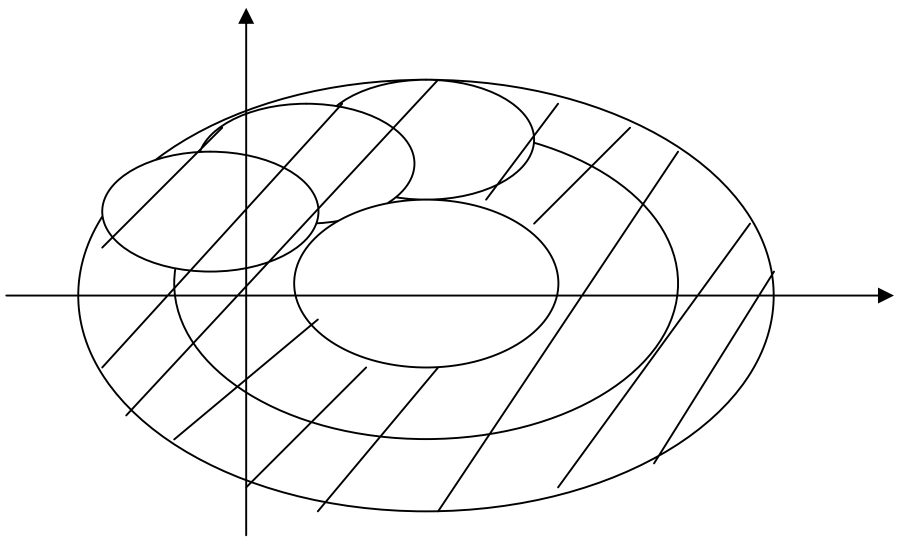
$\dfrac{\frac{1}{D_i^s}}{1-\frac{1}{D_i^s}}$'s trace is



$\dfrac{\frac{1}{D_1^s}}{1-\frac{1}{D_1^s}}+\dfrac{\frac{1}{D_2^s}}{1-\frac{1}{D_2^s}}$'s trace is



When proving we can select $\left\{-\frac{\ln D_i \cdot b}{2\pi}\right\} \in [0,1)$, From that $\lim_{k\to\infty}\left(\sum_{i=1}^{k}\frac{1}{P_i}\right)=\infty$,we know

$\sum_{i=1}^{\infty}\frac{\frac{1}{D_i^s}}{1-\frac{1}{D_i^s}}$ is $\forall$ complex number for proper b

Hence, $\zeta(s)=\sum_{k=1}^{\infty}k^{-s}=1+\sum_{i=1}^{\infty}\frac{\frac{1}{D_i^s}}{1-\frac{1}{D_i^s}}=\forall$ complex number

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$\pm\frac{1}{2}\pm\frac{1}{3}\pm\frac{1}{5}\pm\cdots\pm\frac{1}{P_m}=\frac{P_{m_n}}{\prod_{i=1}^{m}P_i}$ ($P_m-prime$ is not divided by under P_m , P_{m_n} is always $P_m-prime$)

$\pm\frac{1}{2}\pm\frac{1}{3}\pm\frac{1}{5}\pm\cdots\pm\frac{1}{P_m}$ Is continuous for large P_m , we cam find $\left(P_{m_2}:P_{m_3}:P_{m_5}:\cdots\right)$ satisfying

$$\left(P_{m_2}:P_{m_3}:P_{m_5}:\cdots\right)=\left(\frac{1}{\ln 2}:\frac{1}{\ln 3}:\frac{1}{\ln 5}:\cdots\right)$$

And $\left(P_{m_2}:P_{m_3}:P_{m_5}:\cdots\right)=\lim_{n\to\infty}\left(2n\cdot P_{m_2}+1:2n\cdot P_{m_3}+1:2n\cdot P_{m_5}+1:\cdots\right)$

If $2n\cdot P_{m_n}+1$ s are all primes,

$\left\{\frac{k}{2n\cdot P_{m_2}+1}\right\},\left\{\frac{k}{2n\cdot P_{m_3}+1}\right\},\left\{\frac{k}{2n\cdot P_{m_5}+1}\right\},\cdots$ contains every case

$$\frac{0,1,2,3,4,\cdots}{2n\cdot P_{m_2}+1},\frac{0,1,2,3,4,\cdots}{2n\cdot P_{m_3}+1},\frac{0,1,2,3,4,\cdots}{2n\cdot P_{m_5}+1},\cdots$$

And we can find $\left(\left\{\frac{k}{2n\cdot P_{m_2}+1}\right\}:\left\{\frac{k}{2n\cdot P_{m_3}+1}\right\}:\left\{\frac{k}{2n\cdot P_{m_5}+1}\right\}:\cdots\right)=\left(\ln 2:\ln 3:\ln 5:\cdots\right)$

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excluding j -unit $f_i(n)=a_in+b_i$ ($a_i,n,b_i\in\mathbb{Z}$) contains Composite number deservedly

(For example $f_1(n)=n, f_2(n)=n+1, f_3(n)=n+2$)

For $\forall i,$ there exist n_k that $f_i(n_k)$ is a $P_k-prime$, and

$f_i(n_k)\equiv f_i(n_k+n\cdot\prod_{i=1}^{k}P_i)(\mathrm{mod}\,P_k)$, hence $f_i(n_k+n\cdot\prod_{i=1}^{k}P_i)$ is also a $P_k-prime$

And $P_k-prime$ under $P_k{}^2$ is a prime.

Define $\frac{1}{s(k)}$ to ratio of $P_k-prime$ In $1,2,3,\cdots,\prod_{i=1}^{k}P_i$,

For K satisfing $\prod_{i=1}^{k}P_i<K$

ratio of $P_k-prime$ $\le\frac{2}{s(k)+1}$ In $1,2,3,\cdots,K$

Less than $\left(Max(f_i(n))\right)^2$, $Max(f_i(n))$ -unit $f_i(n)$ s are $P_k-prime$, only have a factor

F that satisfies $P_{k+1}\le F\le Max(f_i(n))$

If $\prod_{i=1}^{k}P_i<Max\left(f_i(n)\right)$, ratio of $P_k-prime\le\frac{2}{s(k)+1}$ In $1,2,3,\cdots,Max(f_i(n))$

When arrange only factors of $1,2,3,\cdots,Max(f_i(n))$,

$\bullet\ 2\ \bullet\ 2\ \bullet\ 2\ \bullet\ 2\ \bullet\ \cdots$

$\bullet\ \bullet\ 3\ \bullet\ \bullet\ 3\ \bullet\ \bullet\ 3\ \cdots$

$\bullet\ \bullet\ \bullet\ \bullet\ 5\ \bullet\ \bullet\ \bullet\ \bullet\ \cdots$

$\bullet\ \bullet\ \bullet\ \bullet\ \bullet\ \bullet\ 7\ \bullet\ \bullet\ \cdots$

$\bullet\ \bullet\ \bullet\ \bullet\ \bullet\ \bullet\ \bullet\ \bullet\ \bullet\ \cdots$

When $\forall P_i$'s line moving **horizontally, number of** Composite number doesn't increase from $x\equiv a(\mathrm{mod}\,P_a), x\equiv b(\mathrm{mod}\,P_b)$'s minimum value $<P_a\cdot P_b$

(and from this, we can know there's a prime N~2N easily)

Shortly, we can find sequence of numbers lenth is longer than P_m that $P_m<Max(f_i(n))$

And under $P_m{}^2$, and every numbers take factors only $P_k-prime$ ~ P_m but that's maximum ratio is under $\frac{2j}{s(k)+1}$ -

Hence $Max(f_i(n))$ -unit $f_i(n)$ s under $\left(Max(f_i(n))\right)^2$ contains Composite numbers under ratio $\frac{2}{s(k)+1}$, when it's under $\frac{1}{j}$, j -unit $f_i(n)=a_in+b_i$ can't all numbers are Composite number, Hence there exist n satisfying for $\forall i,\ f_i(n)=a_in+b_i$ is a prime. It's so easy to know $\lim_{k\to\infty}\frac{1}{s(k)}=0$, hence, for $\forall j$, we can find k satisfying $\frac{1}{j}>\frac{2}{s(k)+1}$, there exist n satisfying for $\forall i,\ f_i(n)=a_in+b_i$ is a prime.

When $\frac{1}{j}=\frac{1}{2}>\frac{2}{s(k)+1}$, if $\left(\prod_{i=1}^{k}P_i\right)^2<n$ here some conjecture's are proved

We can always find $f_1(n)=n, f_2(n)=2N-n$ are simultaneously prime (Goldbach's conjecture)

$f_1(n)=n, f_2(n)=2n+1$, Sophie Germain conjecture

$f_1(n)=n, f_2(n)=n+2$, twin prime conjecture

When $\frac{1}{j}=\frac{1}{d}>\frac{2}{s(k)+1}$, if $\left(\prod_{i=1}^{k}P_i\right)^2<n$

$f_1(n)=n+1, f_2(n)=2n+1, f_3(n)=3n+1,\cdots f_d(n)=d\cdot n+1$

Hence we can find infinitely many n that $2n\cdot P_{m_2}+1, 2n\cdot P_{m_3}+1, 2n\cdot P_{m_5}+1,\cdots$ are simultaneously prime,

$$\left(P_{m_2}:P_{m_3}:P_{m_5}:\cdots\right)=\lim_{n\to\infty}\left(2n\cdot P_{m_2}+1:2n\cdot P_{m_3}+1:2n\cdot P_{m_5}+1:\cdots\right)$$

Hence, $\forall\ 0<a<1$, there is b satisfing $\zeta(s)=\sum_{k=1}^{\infty}k^{-s}=0(s=a+bi)$

More over, we can find b that $\zeta(s)=\sum_{k=1}^{\infty}k^{-s}=1+\sum_{i=1}^{\infty}\frac{\frac{1}{D_i^s}}{1-\frac{1}{D_i^s}}$ =any complex number

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