由素数的次幂和引出的欧拉乘积公式

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摘要：将多个素数的次幂和与自然数的次幂和联系起来。

关键词：欧拉乘积公式，黎曼猜想。

如果我没有计算不同素数幂的乘积之和，恐怕我永远不会和欧拉有任何关系，因为知道魔术是如何工作的，这就很简单了。

$\forall m$，n，k，d，$n_k \in \mathbf{N}$，$\forall p$，p_k，$\in$ 素数，$\forall p^n = \frac{p^n-1}{1-p^{-n}}$，$\forall \prod_{k=0}^{\infty} {p_k}^n = \prod_{k=0}^{\infty} \frac{{p_k}^n-1}{1-{p_k}^{-n}}$，

$\forall p^n$ 的约数，例如，p^0，p^1，p^2，p^3，p^4，$\ldots\ldots p^n$，$\forall p^n$ 的约数和，$S_n = \sum_{m=0}^{n} p^m = \frac{p^n-p^0}{p^1-1}$，

$\forall p^n$ 的约数的倒数，例如，p^0，p^{-1}，p^{-2}，p^{-3}，p^{-4}，$\ldots\ldots p^{-n}$，

$\forall p^n$的约数的倒数和，$S_{-n} = \sum_{m=0}^{n} p^{-m} = \frac{p^{-n-1}-p^0}{p^{-1}-1} = \frac{p^{n+1}-p^0}{p^n(p^1-1)}$，

$\Rightarrow \forall p^n = \frac{S_n}{S_{-n}} = \frac{\sum_{m=0}^{n} p^m}{\sum_{m=0}^{n} p^{-m}} = \frac{p^n-p^0}{p^1-1} / \frac{p^{-n-1}-p^0}{p^{-1}-1}$，$\Rightarrow \prod_{k=0}^{\infty} {p_k}^n = \prod_{k=0}^{\infty} \frac{\sum_{m=0}^{n} {p_k}^m}{\sum_{m=0}^{n} {p_k}^{-m}} = \prod_{k=0}^{\infty} \left(\frac{{p_k}^n-{p_k}^0}{{p_k}^1-1} / \frac{{p_k}^{-n-1}-{p_k}^0}{{p_k}^{-1}-1}\right)$，

$$\left(\sum_{m=0}^{2} 2^m\right) = 1+2+4,\quad \left(\sum_{m=0}^{2} 2^m\right) * \left(\sum_{m=0}^{2} 3^m\right) = 1+2+3+4+6+9+12+18+36,$$

$$\left(\sum_{m=0}^{2} 2^m\right) * \left(\sum_{m=0}^{2} 3^m\right) * \left(\sum_{m=0}^{2} 5^m\right) = 1+2+3+4+5+6+9+10+12+15+18+20+25+30+$$

$$36+45+50+60+75+80+100+150+180+225+300+450+900,$$

$n \to \infty$，$\Rightarrow \prod_{k=0}^{\infty} {p_k}^n = \prod_{k=0}^{\infty} \left(\frac{{p_k}^n-{p_k}^0}{{p_k}^1-1} / \frac{{p_k}^{-n-1}-{p_k}^0}{{p_k}^{-1}-1}\right) = \frac{\sum_{d=1}^{\infty} d^{+1}}{\sum_{d=1}^{\infty} d^{-1}}$，$\Rightarrow \sum_{d=1}^{\infty} d^{\pm 1} = \prod_{k=0}^{\infty} \frac{{p_k}^{\pm(n+1)}-{p_k}^0}{{p_k}^{\pm 1}-1}$，

$n \to \infty$，$n_k \to \infty$，$\Rightarrow \prod_{k=0}^{\infty} {p_k}^{s*n_k} = \frac{\sum_{d=1}^{\infty} d^{+s}}{\sum_{d=1}^{\infty} d^{-s}}$，$\Rightarrow \sum_{d=1}^{\infty} d^{\pm s} = \prod_{k=0}^{\infty} \frac{{p_k}^{\pm s(n_k+1)}-{p_k}^0}{{p_k}^{\pm s}-1}$。

$\Rightarrow \sum_{d=1}^{\infty} d^{-s} = \prod_{k=0}^{\infty} \frac{{p_k}^{-s(n_k+1)}-{p_k}^0}{{p_k}^{-s}-1} = \left(\sum_{d=1}^{\infty} d^{+s}\right) \prod_{k=0}^{\infty} \frac{1-{p_k}^{-s*n_k}}{{p_k}^{s*n_k}-1}$。

因此，欧拉乘积公式是不准确的，即，$\sum_{d=1}^{\infty} d^{-s} \neq \prod_{k=0}^{\infty} \frac{1}{1-{p_k}^{-s}}$。

所以，所有引用欧拉乘积公式的文献都是有问题的，与欧拉乘积公式相关的黎曼猜想是错误的。

参考文献：无。

The Euler Product Formula derived from the Sum of the Power of Primes

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Abstract: Relate the sum of powers of multiple primes to the sum of powers of natural numbers.

Key words: Euler product formula, Riemann conjecture.

If I hadn't calculated the sum of the products of different prime powers, I'm afraid I would never have anything to do with Euler, because knowing how magic works, it would be very simple.

$\forall m, n, k, d, n_k \in \mathbf{N}$, $\forall p$, p_k , $\in$ prime numbers , $\forall p^n = \frac{p^n-1}{1-p^{-n}}$, $\forall \prod_{k=0}^{\infty} {p_k}^n = \prod_{k=0}^{\infty} \frac{{p_k}^n-1}{1-{p_k}^{-n}}$,

Divisor of $\forall p^n$, Such as, $p^0, p^1, p^2, p^3, p^4, \dots\dots p^n$, Sum of divisors of $\forall p^n$, $S_n = \sum_{m=0}^{n} p^m = \frac{p^n-p^0}{p^1-1}$,

The reciprocal of the divisor of $\forall p^n$, Such as , $p^0, p^{-1}, p^{-2}, p^{-3}, p^{-4}, \dots\dots p^{-n}$,

The reciprocal sum of the divisor of $\forall p^n$, $S_{-n} = \sum_{m=0}^{n} p^{-m} = \frac{p^{-n-1}-p^0}{p^{-1}-1} = \frac{p^{n+1}-p^0}{p^n(p^1-1)}$,

$\Rightarrow \forall p^n = \frac{S_n}{S_{-n}} = \frac{\sum_{m=0}^{n} p^m}{\sum_{m=0}^{n} p^{-m}} = \frac{p^n-p^0}{p^1-1} / \frac{p^{-n-1}-p^0}{p^{-1}-1}$, $\prod_{k=0}^{\infty} {p_k}^n = \prod_{k=0}^{\infty} \frac{\sum_{m=0}^{n} {p_k}^m}{\sum_{m=0}^{n} {p_k}^{-m}} = \prod_{k=0}^{\infty} (\frac{{p_k}^n-{p_k}^0}{{p_k}^1-1} / \frac{{p_k}^{-n-1}-{p_k}^0}{{p_k}^{-1}-1})$,

$$\left(\sum_{m=0}^{2} 2^m\right) = 1 + 2 + 4 \text{ , } \left(\sum_{m=0}^{2} 2^m\right) * \left(\sum_{m=0}^{2} 3^m\right) = 1 + 2 + 3 + 4 + 6 + 9 + 12 + 18 + 36 \text{ ,}$$

$$\left(\sum_{m=0}^{2} 2^m\right) * \left(\sum_{m=0}^{2} 3^m\right) * \left(\sum_{m=0}^{2} 5^m\right) = 1 + 2 + 3 + 4 + 5 + 6 + 9 + 10 + 12 + 15 + 18 + 20 + 25 + 30 +$$

$36 + 45 + 50 + 60 + 75 + 80 + 100 + 150 + 180 + 225 + 300 + 450 + 900$,

$n \to \infty$, $\Rightarrow \prod_{k=0}^{\infty} {p_k}^n = \prod_{k=0}^{\infty} (\frac{{p_k}^n-{p_k}^0}{{p_k}^1-1} / \frac{{p_k}^{-n-1}-{p_k}^0}{{p_k}^{-1}-1}) = \frac{\sum_{d=1}^{\infty} d^{+1}}{\sum_{d=1}^{\infty} d^{-1}}$, $\sum_{d=1}^{\infty} d^{\pm 1} = \prod_{k=0}^{\infty} \frac{{p_k}^{\pm(n+1)}-{p_k}^0}{{p_k}^{\pm 1}-1}$,

$n \to \infty$, $n_k \to \infty$, $\Rightarrow \prod_{k=0}^{\infty} {p_k}^{s*n_k} = \frac{\sum_{d=1}^{\infty} d^{+s}}{\sum_{d=1}^{\infty} d^{-s}}$, $\sum_{d=1}^{\infty} d^{\pm s} = \prod_{k=0}^{\infty} \frac{{p_k}^{\pm s(n_k+1)}-{p_k}^0}{{p_k}^{\pm s}-1}$.

$\Rightarrow \sum_{d=1}^{\infty} d^{-s} = \prod_{k=0}^{\infty} \frac{{p_k}^{-s(n_k+1)}-{p_k}^0}{{p_k}^{-s}-1} = (\sum_{d=1}^{\infty} d^{+s}) \prod_{k=0}^{\infty} \frac{1-{p_k}^{-s*n_k}}{{p_k}^{s*n_k}-1}$,

So, the Euler product formula is not accurate, that is, $\sum_{d=1}^{\infty} d^{-s} \neq \prod_{k=0}^{\infty} \frac{1}{1-{p_k}^{-s}}$.

Therefore, all papers quoting the Euler product formula are problematic, and the Riemann conjecture related to the Euler product formula is wrong.

Reference: none.