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The proof of the Fermar's Last Theorem, Mersenne's prime conjecture and Poincare Conjecture In Euclidean Geomertry

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ABSTRACT:
In order to strictly prove from the point of view of pure mathematics Goldbach's 1742 Goldbach conjecture and Hilbert's twinned prime conjecture in question 8 of his report to the International Congress of Mathematicians in 1900, and the French scholar Alfond de Polignac's 1849 Polignac conjecture, By using Euclid's principle of infinite primes, equivalent transformation principle, and the idea of normalization of set element operation, this paper proves that Goldbach's conjecture, twin primes conjecture and Polignac conjecture are completely correct. In order to strictly prove a conjecture about the solution of positive integers of indefinite equations proposed by French scholar Ferma around 1637 (usually called Ferma's last theorem) from the perspective of pure mathematics, this paper uses the general solution principle of functional equations and the idea of symmetric substitution, as well as the inverse method. It proves that Fermar's last theorem is completely correct.

Key words:
Twin prime conjecture, Polignac conjecture, Goldbach conjecture, the infinitude of prime numbers, the principle of equivalent transformations, the idea of normalization of set element operations, Fermat indefinite equation, functional equation decomposition, symmetric substitution, prime number principle, proof by contradiction.

I. INTRODUCTION

In a 1742 letter to Euler, Goldbach proposed the following conjecture: any integer greater than 2 can be written as the sum of three prime numbers. But Goldbach himself could not prove it, so he wrote to ask the famous mathematician Euler to help prove it, but until his death, Euler could not prove it.The convention "1 is also prime" is no longer used in the mathematical community, but this paper needs to restore the convention "1 is also prime". The modern statement of the original conjecture is that any integer greater than 5 can be written as the sum of three prime numbers. ($n > 5$: When n is even, n=2+(n-2), n-2 is also even and can be decomposed into the sum of two prime numbers; When n is odd, n=3+(n-3), which is also an even number, can be decomposed into the sum of two primes.) Euler also proposed an equivalent version in his reply, that any even number greater than 2 can be written as the sum of two primes. The common conjecture is expressed as Euler's version. The statement "Any sufficiently large even number can be represented as the sum of a number of prime factors not more than a and another number of prime factors not more than b" is written as "a+b". A common conjecture statement is Euler's version that any even number greater than 2 can be written as the sum of two prime numbers, also known as the "strong Goldbach conjecture" or "Goldbach conjecture about even numbers". From Goldbach's conjecture about even numbers, it follows that any odd number greater than 7 can be represented as the sum of three odd primes. The latter is called the "weak Goldbach conjecture" or "Goldbach conjecture about odd numbers". If Goldbach's conjecture is true about even numbers, then Goldbach's conjecture about odd numbers will also be true.Twin primes are pairs of prime numbers that differ by 2, such as 3 and 5, and 7, adn 11 and 13. . This conjecture, formally proposed by Hilbert in Question 8 of his report to the International Congress of Mathematicians in 1900, can be described as follows:There are infinitely many prime numbers p such that p + 2 is prime.Prime pairs (p, p + 2) are called twin primes.In 1849, Alphonse de Polignac made the general conjecture that for all natural numbers k, there are infinitely many prime pairs (p, p + 2k). The case of k = 1 is the twin prime conjecture. Around 1637, the French scholar Fermat, while reading the Latin translation of Diophatus' Arithmetics, wrote next to proposition 8 of Book 11: "It is impossible to divide a cubic number into the sum of two cubic numbers, or a fourth power into the sum of two fourth powers, or in general to divide a power higher than the second into the sum of two powers of the same power. I am sure I have found a wonderful proof of this, but the blank space here is too small to write."Around 1637, the French scholar Fermat, while reading the Latin translation of Diophatus' Arithmetics, wrote next to proposition 8 of Book 11: "It is impossible to divide a cubic number into the sum of two cubic numbers, or a fourth power into the sum of two fourth powers, or in general to divide a power higher than the second into the sum of two powers of the same power. I am sure I have found a wonderful proof of this, but the blank space here is too small to write."Since Fermat did not write down the proof, and his other conjectures contributed a lot to mathematics, many mathematicians were interested in this conjecture. The work of mathematicians has enriched the content of number theory, involved many mathematical means, and promoted the development of number theory.

II .CONCLUSIONREASONING

Elementary proof of Goldbach's conjecture

In a 1742 letter to Euler, Goldbach proposed the following conjecture: any integer greater than 2 can be written as the sum of three prime numbers. But Goldbach himself could not prove it, so he wrote to ask the famous mathematician Euler to help prove it, but until his death, Euler could not prove it.The convention "1 is also prime" is no longer used in the mathematical community, but this paper needs to restore the convention "1 is also prime". The modern statement of the original conjecture is that any integer greater than 5 can be written as the sum of three prime numbers. When n is even, n=2+(n-2), n-2 is also even and can be decomposed into the sum of two prime numbers; When n is odd, n=3+(n-3), which is also an even number, can be decomposed into the sum of two primes.) Euler also proposed an equivalent version in his reply, that any even number greater than 2 can be written as the sum of two primes. The common conjecture is expressed as Euler's version. The statement "Any sufficiently large even number can be represented as the sum of a number of prime factors not more than a and another number of prime factors not more than b" is written as "a+b". A common nt of number theory.

Suppose N=2p+3q(p, q, N are all any non-negative integers),then N=2(p+q)+q(p, q, N are all any non-negative integers), when q is any even number, then N=2(p+q)+q(p, q an N are all any non-negative integers, q is any even number) is any even number, when q is any odd number, then N=2(p+q)+q(p, N are any non-negative integers, q is any odd number) can represent any odd number, so N=2(p+q)+q(p, q, N are any non-negative integers) can represent any non-negative integer. Since

N=2p+3q(p, q, and N are any non-negative integers), then N=2p+3(q-1)+3(p, q, and N are any non-negative integers), then N+1=(2p+1)+3(q-1)+3(p, q, and N are any non-negative integers), then

N+1=(2p+1)+3(2q-1)+3-3q(p, q, N are any nonnegative integer), then

N+(1+3q)=(2p+1)+3(2q-1)+3(p, q, N are any nonnegative integer), then

N+(1+3q)-2(2q-1)=(2p+1)+(2q-1)+3(p, q, N are any one non-negative integer), that is,

N+(3-q)=(2p+1)+(2q-1)+3(p, q, N are any nonnegative integer). Because (2p+1)(p is any non-negative integer), (2q-1)(q is any non-negative integer), and 3 are odd number, and because N is any non-negative integer an integer, (3-q)(q is any non-negative integer) is also any non-negative integer, then N+(3-q)(q and N are any non-negative integers) is still any non-negative integer, and N is any odd number, then N=(2p+1)+(2q-1)+3(p, q, N are any a non-negative integer) is true, and N is any odd number. Since p and q are any non-negative integers, so (2p+1)(p is any non-negative integer) and (2q-1)(q is any non-negative integer) must can both be prime numbers.Since prime numbers are odd, and there are infinitely many primes, it has been proved by Euclid , prime numbers can be infinite, or they can be small enough until they are 1,when an odd number is not prime, it can always be added to or subtracted from several times the value of 2, that is, it can always be added to or subtracted from 2k(k is any positive integer) to become prime. When (2p+1) and (2q-1) are odd and not prime, they become prime by adding or subtracting 2k(where k is any positive integer). At the same time (2p+1) and (2q-1) add or subtract 2k(k is any positive integer) to become prime numbers, if you think of them as smaller primes, you can also think of N as smaller non-negative integers, if you think of them as larger primes, you can also think of N as larger non-negative integers, Since the non-negative positive number N is still any non-negative integer after adding or subtracting the even number 2k(k is any positive integer), any odd number in any non-negative integer can always be written as the sum of three primes. There must be a prime number of 3, according to the equation N=(2p+1)+(2q-1)+3(p, q, N are any non-negative integers), then N-3=(2p+1)+(2q-1)(p, q, N are any non-negative integers), Since (n-3)(N is any non-negative integer) is any odd number minus 3, so (N-3)(N is any non-negative integer) is any even number, so any even number in any non-negative integer can always be written as the sum of two prime numbers.When (2p+1) is prime, leave (2p+1) unchanged, or if you add or subtract 2k(k is any positive integer), then (2p+1) add or subtract 2k(k is any positive integer), it can always become another prime number. And when (2p+1) is not prime, add the value of p to k(k is any positive integer), such that 2(p+k)+1 can be a prime, or subtract the value of p from k(k is any positive integer), such that 2(p-k)+1 can also be a prime, Then the equation N=(2p+1)+(2q-1)+3(p, q, N are any nonnegative integer) becomes the N+2k=[2(p+k)+1]+(2q-1)+3(p, q, N are arbitrary a nonnegative integer), or equation N=(2p+1)+ (2q-1)+3 (p, q, N are arbitrary a nonnegative integer) becomes N-2k=[2(p-k)+1]+(2q-1)+3(p, q, and N are all any non-negative integers, and k is any positive integer), because N is any non-negative integer, so N+2k(k is any positive integer) and N-2k(k is any positive integer) are both any non-negative integers,so N=[2(p+k)+1]+(2q-1)+3 (p, q, N are any nonnegative integer, k for any positive integer) or N=[2(p-k)+1]+(2q-1)+3 (p, q, N are any nonnegative integer, k for any positive integer) was established. In the same way, since when (2q-1)(q is any non-negative integer) is prime, keep (2q-1)(q is any non-negative integer) unchanged, or if you add or subtract 2k(k is any positive integer), then (2q-1) add or subtract 2k(k is any positive integer), it can always become another prime number.. And when (2q-1)(q is any non-negative integer) is not prime, add the value of q to k(k is any positive integer), so that 2(q+k)-1 must be a prime number.,or the value of q minus k(k is any positive integer), such that 2(q-k)-1(q is any non-negative integer,k for any positive integer) must also be a prime number, I use the symbol (+/-) to mean adding or subtracting between two numbers, then the equation N=[2(p(+/-)k)+1]+(2q-1)+3(p, q, N are any non-negative integers, k for any positive integer) becomes the N+2k=[2(p(+/-)k)+1]+[2(q+k)-1]+3(p, q, N are any nonnegative integer, k for any positive integer), or the equation N=[2(p(+/-)k)+1]+(2q-1)+3(p, q, N are any nonnegative integer, k for any positive integer) becomes N-2k=[2(p(+/-)k)+1]+[2(q-k)-1]+3(p, q, N are any nonnegative integer, k for any positive integer), because the nonnegative integer N is arbitrary, So N+2k(k is any positive integer) and N-2k (k is any positive integer) are both arbitrary non-negative integers, which is odd, which means that any odd number can be written as the sum of three prime numbers, [2(p(+/-)k)+1] (p is any nonnegative integer, k for any positive integer), [2(q(+/-)k)-1] (q is any nonnegative integer, k for any positive integer), and 3 are all prime numbers. So we can make both (2p+1)(p being any non-negative integer) and (2q-1)(q being any non-negative integer) prime numbers, The variable N to the left of the equation N=(2p+1)+(2q-1)+3(p, q, N are all any non-negative integers) is an arbitrary non-negative integer, can not to tube, or equations [N(+/-)2k]=[2(p(+/-)k)+1]+[2(q(+/-)k)-1]+3(p, q, N are arbitrary a nonnegative integer, k for any positive integer) on the left side of the variable [N(+/-)2k] is an arbitrary nonnegative integers, can need not tube. So we can make both (2p+1)(p being any non-negative integer) and (2q-1)(q being any non-negative integer) prime numbers, equation N=(2p+1)+(2q-1)+3(p, q, N are any nonnegative integer) on the left side of the nonnegative integer variables N is an arbitrary, can need not tube, or can make both [2(p(+/-)k)+1](p for arbitrary a nonnegative integer, k for any positive intege) and [2(q(+/-)k)-1)](q for arbitrary a nonnegative integer, k for any positive intege) prime numbers, equation [N(+/-)2k]=[2(p(+/-)k)+1]+[2(q(+/-) k)–1]+3(p, q, N are any nonnegative integer) on the left side of the variable [N(+/-)2k] is an arbitrary nonnegative integers, can need not tube. The equation N=(2p+1)+(2q-1)+3(p, q, N are all any non-negative integer) is obtained again, which is true, where (2p+1)(p is any non-negative integer),(2q-1)(q is any non-negative integer), and 3 are all prime numbers.Since (2p+1)+(2q-1)+3(p, q, N are any non-negative integers) can not be any even number, the variable N to the left of the equation

N=(2p+1)+(2q-1)+3(p, q, N are all any non-negative integers) is an arbitrary non-negative integer, which can be ignored, then N=(2p+1)+(2q-1)+3(p, q, N are any non-negative integers) means that there is the any odd number of the sum of three prime numbers , and N is any odd number, and N=(2p+1)+(2q-1)+1(p, q, N are any non-negative integers) can also be true, so any odd number must be written as the sum of three prime numbers, one of which must be 3, and any odd number can be written as the sum of three prime numbers, one of which must be 1. Because both N-3=(2p+1)+(2q-1)(p, q, and N are any non-negative integers) and N-1=(2p+1)+(2q-1)(p, q, and N are any non-negative integers) are true, and both N-3 and N-1 are any even number, and both (2p+1)(p being any non-negative integer) and (2q-1)(q being any non-negative integer) are prime numbers, then any even number can be written as the sum of any finite number of prime pairs, and then any even number can be written as the sum of two primes, so Goldbach's conjecture holds.

At the same time, according to the N-3=(2p+1)+(2q-1)(p, q, N are any nonnegative integer), get (N-3)-2(2q-1)=(2q-1)-2(2q-1)=(2p+1)-(2q-1)(p, q, N are all any non-negative integers), according to

N-1=(2p+1)+(2q-1)(p, q, N are all any non-negative integers),

get (N-1)-2(2q-1)=(2p+1)+(2q-1)-2(2q-1)=(2p+1)-(2q-1)(p, q, N are any nonnegative integer), and N-3 and N-1 are any even number, So (N-3)-2(2q-1) and (N-1)-2(2q-1) both represent any even number, and (2p+1)(p is any non-negative integer) and (2q-1)(q is any non-negative integer) are both prime numbers, so any even number can be written as the difference of any infinite pair of prime numbers, so the twin prime conjecture and the Polignac conjecture are both correct.

At the same time, I discovered a prime number generation (or construction) mechanism,I first give a construction formula of prime numbers N=2p-q(p is any non-negative integer, q, N are any prime) or N=kp-q(p is any non-negative integer, k is any positive integer, q, N are any prime), and I prove this formula below. Based on myproof that N=(2p+1)+(2q-1)+3 (p, q, and N are all arbitrary non-negative integers),we get N-2×(2q-1)-2×3=(2p+1)-(2q-1)-3(p, q, and N are all arbitrary non-negative integers), where *means multiplication, N-2×(2q-1)-2×3 is still any non-negative integer, then

N=(2p+1)-(2q-1)-3(p, q, N are all any non-negative integers) holds, then N+(2q-1)-1=2p-3(p, q, N are all any non-negative integers), Since N+(2q-1)-1 is still any non-negative integer, so N=2p-3(p and N are any non-negative integers) is true, then N-q=2p-q-3(p and N are non-negative integers, q is prime) is true, then N-q+3=2p-q(p and N are non-negative integers) is true, then N-q+3=2p-q(p and N are non-negative integers, q is any prime number) is true, because n-q+3 is still a non-negative integer, so N=2p-q(p and N are non-negative integers, q is any prime number) is true, and N=kp-q(p and N are non-negative integers, k is any positive integer, q is any prime number) is also true, because any non-negative integer must contain all prime numbers, Therefore, N=2p-q(p is any non-negative integer, q and N are any prime numbers) is true, and N=kp-q(p is any non-negative integer, k is any positive integer, q and N are any prime numbers) is also true. If N=2p-q(p being any non-negative integer, q and N being any prime) holds, we know that when q is equal to p, then there must be at least one prime between any prime q and 2q, and N=kp-q(p being any non-negative integer, k being any positive integer, q and N are all any prime numbers) shows that any prime number can be constructed by subtracting any prime number q(q is less than kp, k being any positive integer) from kp(k is any positive integer) .The formula N=kp-q(p is any non-negative integer, q and N are any prime numbers,k is any positive integer) can also be written as N=2p+10^r-q(p and r are any positive integers,k is any positive integer and N is any prime number, q is the numbers in the set {1, 3, 5, 7}).If q and p are mutually different primes, then for any two mutually different primes q and p,N=kp-q(p, N are any non-negative integers, k is any positive integer, q is any prime number), N+2q=kp+q(p, N are any non-negative integers, k is any positive integer, and q is any prime number) is obtained, N+2q= kp+q (p, N are any non-negative integers, k is any positive integer, q is any prime number), then N=kp+q(p, N is any non-negative integer, k is any positive integer, q is any prime number,), because the non-negative integer N must contain all prime numbers, then N=kp+q(q, p, N are all any prime numbers, and q is prime to p, k is any positive integer),so there are infinitely many prime numbers of the form q+kp, where k is a positive integer, i.e. in the arithmetic sequence q+p,q+2p,q+3p,..... ,There are infinitely many prime numbers, there are infinitely many prime moduli p congruence q, so we have proved Dirichlet's theorem.

The proof of Fermat's Last theorem conjecture

Fermat's Last Theorem, also translated as "Fermat's Last Theorem", is often referred to as Fermat's conjecture in old literature. It asserts that there are no three mutually unequal and non-equal positive integers x,y,z such that when $n(n \in Z^+)$ is greater than 2, the equation $x^n + y^n = z^n$(also known as Fermat's equation) has a solution.Fermat's Last Theorem was proposed by the French mathematician Pierre deFermat as a theorem around 1637. He stated this proposition in the margins of Diophantus' Latin translation of the Arithmeticae: It is impossible to divide a cubic square integer into two cubic square integers, or a quartic square integer into two quartic square integers, or generally speaking, any positive integer higher than the power of two into two higher-order square integers. I have discovered a truly wonderful proof, but this margin is too narrow to fit. Fermat's Last Theorem was difficult to prove at that time, so it was often called Fermat's Conjecture rather than a theorem, and the proof Fermat referred to was not recognized either. Countless mathematicians have attempted to prove this proposition but all ended in failure. This paper proves the conjecture.

Proof

Method 1：

Fermat's Last Theorem states that perhaps equation $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, and x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$) has no positive integer solution. Now I will prove it by contradiction.

Suppose $x^n + y^n = z^n$
($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$)

has a positive integer solution,then for α=-n(n ∈ Z^+ and n ≥ 1, α ∈ Z), then $x^{-\alpha}+y^{-\alpha}=z^{-\alpha}$($\alpha \in Z, x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $\alpha =- n, n \in Z^+$ and n ≥ 1) is consistent with $x^n+y^n=z^n$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n >= 1) and they have the same positive integer solution (x,y,z).Based on $x^{-\alpha}+y^{-\alpha}=z^{-\alpha}$($\alpha \in Z, x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $\alpha =- n, n \in Z^+$ and n ≥ 1), we obtain

$\frac{1}{x^\alpha}+\frac{1}{y^\alpha}=\frac{1}{z^\alpha}$,then $\frac{y^\alpha+x^\alpha}{x^\alpha y^\alpha}=\frac{1}{z^\alpha}$, is also $z^\alpha=\frac{x^\alpha y^\alpha}{y^\alpha+x^\alpha}$. If we replace α with -α, we have: $z^{-\alpha}=\frac{x^{-\alpha}y^{-\alpha}}{y^{-\alpha}+x^{-\alpha}}$ $=\frac{x^{-\alpha}y^{-\alpha}}{z^{-\alpha}}=(\frac{xy}{z})^{-\alpha}$($\alpha \in Z, x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $\alpha =- n, n \in Z^+$ and n ≥ 1),then $z=\frac{xy}{z}$, is also $z^2=xy$($\alpha \in Z, x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 3)

Now let me prove that in fact $z^2=xy$($x \in R, y \in R, z \in R$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 1)
can not hold be true.

Base $x^n+y^n=z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$and n ≥ 1) ,
we put $z^2=xy$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$and n ≥ 1) into $x^2+y^2=z^2$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1) , then $x^2+y^2=z^2=xy$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1),
then x^2+y^2- xy=0($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1),

but x^2+y^2- xy=$\left(x-\frac{y}{2}\right)^2+\frac{3y^2}{4}$ >0, then x^2+y^2- xy=0

($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1)
has no positive integer roots.,so
$z^2=xy$
($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1)
can hold be true,
but $z^2=xy$
($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1)
can not hold be true.
And because $x^2+y^2=z^2$

($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1) must have a positive integer solution,and because of $x^2 + y^2 - 2xy = z^2 - 2xy$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1),

so $(x - y)^2 = z^2 - 2xy \geq 0$

($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1) ,If and only if $x = y$, takes the equal sign in the inequality.But because x, y, and z are not equal to each other, and x, y, and z are not equal to 1, so $z^2 - 2xy > 0$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1), that is to say,

$z^2 > 2xy = xy + xy$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1), so

$z^2 > xy$($x \in R, y \in R, z \in R$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1).So when $z^2 = xy$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1), then $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$and $n \geq 1$) can not hold be true for having a positive integer solutions.

When $z^2 = xy$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1) , then $z^{2n} = x^n y^n$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and$n \geq 1$),and

$z^n = x^{\frac{n}{2}} y^{\frac{n}{2}}$(

$x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$),then, according to $x^n + y^n = z^n$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$),

get $x^n + y^n = x^{\frac{n}{2}} y^{\frac{n}{2}}$(

$x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$),

then $\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}} + \frac{y^{\frac{n}{2}}}{x^{\frac{n}{2}}} = 1$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1, x \neq 0$， $y \neq 0$),supose $\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}} = t$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1, x \neq 0, y \neq 0$),then $t + \frac{1}{t} = 1$, that is $t^2 - t + 1 = 0$, because $\Delta = (-1)^2 - 4 \times 1 \times 1 = -3 < 0$, so

t^2-t+1=0 has no real root, it's root is a complex number with an imaginary number.That is to say,

$\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}}$(x ∈ C, y ∈ C, z ∈ C, x,x,y,z are not equa each other, and x,y,z are not equal to 1 x,y,z are and

x,y,z are not equal to 1, $n \in Z^+$ and $n \geq 1$,x≠0,y≠0) is a complex number with imaginary numbers where x and y can not be both real numbers, and neither x nor y can be zero. Therefore, when z^2=xy(x ∈ C, y ∈ C, z ∈ C,x,y,z are not equal each other, and x,y,z are not equal to 1), $x^n + y^n = z^n$(x ∈ C, y ∈ C, z ∈ C,x,y,z are not equal to each other, and x,y,z are all equal to 1, $n \in Z^+$ and $n \geq 1$,x≠0,y≠0) has no real roots, no rational roots, and no positive integer roots.

When z^2<xy(x ∈ R, y ∈ R, z ∈ R,x, y, and z are not equal to each other, and z are not equal to 1, $n \in Z^+$ and n ≥1), then $z^{2n} < x^n y^n$(x ∈ R, y ∈ R, z ∈ R, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ andn ≥ 1),then

$z^n < x^{\frac{n}{2}} y^{\frac{n}{2}}$(x ∈ R, y ∈ R, z ∈ R, x, y, and z are not equal to each other, x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 1),then according to $x^n + y^n = z^n$(x ∈ C, y ∈ C, z ∈ C, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 1), get

$x^n + y^n < x^{\frac{n}{2}} y^{\frac{n}{2}}$(x ∈ R, y ∈ R, z ∈ R ,

x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 1),

Then $\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}} + \frac{y^{\frac{n}{2}}}{x^{\frac{n}{2}}}$<1(x ∈ R, y ∈ R, z ∈ R,x, y, andzarenotequaltoeachother, andx, y, andzare not equal to 1, $n \in Z^+$ and n ≥ 3, x ≠ 0， y ≠ 0),

supose $\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}}$=t(

x ∈ C, y ∈ C, z ∈ C, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 1,x≠0, y≠0),then t+$\frac{1}{t}$<1, that is t^2-t+1<0, because $(t-\frac{1}{2})^2+\frac{3}{4}$<0, so t^2-t+1<0 has no real root, its roots are imaginary roots. That is to say, $\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}}$ is an imaginary number, then x and y cannot both be real numbers, and neither x nor y can be zero.So when z^2<xy(x ∈ R, y ∈ R, z ∈ R,

x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ andn ≥1) then $x^n + y^n = z^n$(x ∈ C, y ∈ C, z ∈ C, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$ and n ≥ 1, x ≠ 0, y ≠ 0)has no roots of real numbers, no roots of rational numbers, and no roots of positive integers.

So when z^2<xy(x ∈ R, y ∈ R, z ∈ R,x,y,z are not equal to each other, and x,y,z are not equal to 1,$n \in Z^+$ and n ≥ 1),then $x^n + y^n = z^n$(x ∈ C, y ∈ C, z ∈ C,x,y,z are not equal to each other, and x,y,z are not equal to 1,$n \in Z^+$ and n ≥ 1) has roots with imaginary numbers where x

and y are not real numbers .
When $xy < z^2 \leqq 2xy(x \in R, y \in R, z \in R$,x,y,z are not equal to each other, and x,y,z are all not equal to 1), so $z^{2n} > x^n y^n (x \in R, y \in R, z \in R$, x, y, z are not equal each other, and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 1$) , according to $x^n + y^n = z^n (x \in C, y \in C, z \in C$, x, y, z are not equal each other, and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 1$), $x^n + y^n = z^n (x \in C, y \in C, z \in C$, x, y, z are not equal each other, and x, y, z are all not equal to 1, and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 1$), so $x^n + y^n > x^{\frac{n}{2}} y^{\frac{n}{2}} (x \in R, y \in R, z \in R$, and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 1$, x≠0, y≠0). Assuming $\frac{x^{\frac{n}{2}}}{y^{\frac{n}{2}}} + \frac{y^{\frac{n}{2}}}{x^{\frac{n}{2}}} > 1 (x \in R, y \in R, z \in R$, x, y, z are not equal each other, and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 1$, x≠0, y≠0), then $t + \frac{1}{t} > 1$, namely the $t^2 - t + 1 > 0$, $\left(t - \frac{1}{2}\right)^2 + \frac{3}{4} > 0$, t can obtain real root and rational root, so both x and y can obtain real roots and rational roots. So when $xy < z^2 \leqq 2xy(x \in R, y \in R, z \in R$, x, y, z are not equal each other , and x, y, z are all not equal to 1), $x^n + y^n > z^n (x \in R, y \in R, z \in R$, x, y, z are not equal each other , and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 3$, x≠0, y≠0) has real number roots, rational number roots, but no positive integer roots. When the $xy < z^2 \leqq 2xy(x \in R, y \in R, z \in R$, x, y, z are equal, and x, y, z is not equal to 1), then $x^n + y^n < z^n (x \in R, y \in R, z \in R$, x, y, z are not equal each other , and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 3$, x≠0,y≠0) has not real number roots, and has rational number roots, and no positive integer roots. And when $xy < z^2 \leqq 2xy(x \in R, y \in R, z \in R$, x, y, z are equal, and x, y, z is equal to 1) , $x^n + y^n = z^n (x \in R, y \in R, z \in R$, x, y, z are not equal each other , and x, y, z are all not equal to 1, $n \in Z^+$ and $n \geq 3$,x≠0,y≠0) has roots of real numbers, and has roots of rational numbers, and has no roots of positive integers.
And when $xy < z^2 \leqq 2xy$ ($x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1), that is $\sqrt{xy} < z \leqq \sqrt{2xy}$ ($x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1). So $\sqrt{x^n z^n} < z^n \leqq \sqrt{2x^n z^n}$ ($x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 3$), and $x^n + y^n > 2\sqrt{x^n z^n}$ ($x \in R, y \in R , z \in R$ x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 3$), so $x^n + y^n > z^n (x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 3$)has real roots and has roots of rational numbers, but no integer roots.
So when $xy < z^2 \leqq 2xy(x \in R, y \in R, z \in R$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1), then $x^n + y^n < z^n (x \in R, y \in R, z \in R$, x,y,z are not equal to each other, $n \in Z^+$ and $n \geq 3$, $\sqrt{xy} < z \leqq \sqrt{2xy}$, and x,y,z are not equal to 1) has no real roots and has no roots of rational numbers, and has no integer roots. However, when $xy < z^2 \leqq 2xy(x \in R, y \in R, z \in R$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1), $x^n + y^n = z^n (x \in R, y \in R, z \in R$, x,y,z are not equal to each other , $\sqrt{xy} < z \leqq \sqrt{2xy}$, and x,y,z are not equal to 1,$n \in Z^+$ and $n \geq 3$)has roots of real numbers, roots of rational numbers, and has no roots of positive integers.
However, when $1 \leqq n \leqq 2(n \in Z^+)$, $x^n + y^n = z^n$ ($x \in R, y \in R, z \in R$, x,y,z are not equal to each other, $\sqrt{xy} < z \leqq \sqrt{2xy}$, and x,y,z are not equal to 1, $n \in Z^+$ and $1 \leqq n \leqq 2$)has roots

of real numbers, and has roots of rational numbers, and has no roots of positive integers. Because only when $z^2 > 2xy(x \in R, y \in R, z \in R, x, y, z$ are not equal to each , and x, y, z are not equal to $1, n \in Z^+$ and $1 \leqq n \leqq 2)$, then $x^n + y^n = z^n(x \in C, y \in C, z \in C$,x,y, and z are not equal to each other, and x,y,z are not equal to 1, $\sqrt{xy} < z \leqq \sqrt{2xy}$, $n \in Z^+$ and $1 \leqq n \leqq 2)$ has real roots and has roots of rational numbers, and has roots of positive integers.

Euler proved $x^3 + y^3 = z^3(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x, y, z is not equal to 1, $n \in Z^+$ and $n \geq 3)$ and $x^4 + y^4 = z^4(x \in R, y \in R, z \in R, z \in Z^+$, x,y, and z are not equal to each other, and x, y, z are not equal to 1, $n \in Z^+$ and $n \geq 3)$ has roots of real numbers, and has roots of rational numbers, and has no roots of positive integers.

When $z^2 > 2xy$ $(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to $1, n \in Z^+$ and $n \geq 3)$, then $z^{2n} > 2^n x^n z^n$ $(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1), so $z^n > \sqrt{2^n x^n z^n} = \sqrt{2^n}\sqrt{x^n z^n}$ $(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to $1, n \in Z^+$ and $n \geq 3)$, and $x^n + y^n > 2\sqrt{x^n z^n}(x \in R, y \in R, z \in R$,x,y, and z are not equal to each other, and x,y, and z are not equal to $1, n \in Z^+$ and $n \geq 3)$, then $\sqrt{2^n} > 2(n \in Z^+$ and $n \geq 3)$, so $x^n + y^n < z^n(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to $1, z^2 > 2xy$, $n \in Z^+$ and $n \geq 3)$ has real roots , and has roots of rational numbers, and positive integer roots. That is to say, $x^n + y^n = z^n(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $z^2 > 2xy$, $n \in Z^+$ and $n \geq 3)$ has roots of real numbers, and has roots of rational numbers, and has no roots of positive integers.If $1 \leqq n \leqq 2(n \in Z^+)$, then $1 < \sqrt{2^n} \leqq 2$, $x^2 + y^2 = z^2(x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $z^2 > 2xy$, $n \in Z^+$) have real roots ,and has roots of rational numbers, and has roots of positive integer , and x +y =z $(x \in R, y \in R, z \in R$,x,y, and z are not equal to each other, and x ,y, and z are not equal to $1, z^2 > 2xy$, $n \in Z^+$)has roots of real numbers and has roots of rational numbers, and has no roots of positive integers.

That is to say, the previous assumption that $x^n + y^n = z^n(x \in Z^+, y \in Z^+$, $z \in Z^+$, x,y,z are not equal to each other, and x,y,z are not equal to 1, $n \in Z^+$ and $n \geq 3)$ has a positive integer solution can not hold be true .

So it is not true that $x^n + y^n = z^n(x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3)$ has a positive integer solution, $x^n + y^n \neq z^n(x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3)$ can hold be true when it has a positive integer solution. And only when $z^2 > xy$ ($x \in R, y \in R, z \in R$,x, y, and z are not equal to each other, and x, y, z are not equal to 1), $x^n + y^n = z^n(x \in C, y \in C, z \in C$,x, y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1)$ has roots of real numbers, and has roots of rational numbers, and has no roots of positive integers.

So $x^n + y^n = z^n(x \in Z^+, y \in Z^+$, $z \in Z^+$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$and $n \geq 3)$ has no integer solutions. So Fermar's Last Theorem can hold be true completely.

Becarse α=-n($n \in Z^+$ and $n \geq 1$),suppose

$f(\alpha) = z^\alpha - \frac{y^\alpha + x^\alpha}{x^\alpha y^\alpha}$

$(x \in C, y \in C, z \in C, x, y,$ and z are not equal to each other, and x, y, z is not equal to $1)$,

and f(-α)= $z^{-\alpha}$- $\frac{x^{-\alpha}y^{-\alpha}}{y^{-\alpha}+x^{-\alpha}}$

$(x \in C, y \in C, z \in C, x, y,$ and z are not equal to each other, and x, y, z is not equal to $1)$.

If Fermat's Last Theorem does not hold, that is, x,y, and z have unequal and non-equal positive integer solutions, then under the condition that the value of z is equal to the arithmetic square root of xy, when the value of the independent variable of the function f(α) is replaced by -α and the function value remains zero, then according to the assumption, the value x,y,z in z^2=xy

$(x \in C, y \in C, z \in C, x, y,$ and z are not equal to each other, and x, y, z is not equal to $1, n \in Z^+$ and $n \geq 1)$ should also be positive integers. But this is impossible, because if x,y, and z are unequal and not equal to 1, and they are positive integer solutionss of $x^n + y^n$=z^n($x \in C, y \in C, z \in C,, x, y,$ and z are not equal to each other, and x, y, z is not equal to $1, n \in Z^+$ and $n \geq 1)$, then the value of z must be greater than the arithmetic square root of xy, that is, z^2>2xy(

$(x \in R, y \in R, z \in R, x, y,$ and z are not equal to each other, and x, y, z is not equal to 1 .Because when x,y, and z are solutions of positive integers that are not equal to each other and not equal to 1, the value of z must be greater than the arithmetic square root of xy. When the value of z is greater than the arithmetic square root of xy, the value of the independent variable of the function f(α) can not be completed. The value of a is replaced by -a, but the function value remains zero. Because when the value of z is greater than the arithmetic square root of xy, even if f(α) equals zero, f(-α) is not equal to zero.

The graph of an odd function is symmetrical about the origin O(0,0), while the graph of an even function is symmetrical about the vertical axis (Y-axis), and the origin O(0,0) is also on the vertical axis (Y-axis). Therefore, the graph of an even function can also be regarded as symmetrical about the vertical axis (Y-axis) and the origin O(0,0).

According to α=-n($n \in Z^+$ and $n \geq 1)$,

f(α) =$z^\alpha - \frac{y^\alpha+x^\alpha}{x^\alpha y^\alpha}$(x ∈ C, y ∈ C , z ∈ C,x, y, z are not equal each other, and x, y, z is not equal to 1),f(-α)= $z^{-\alpha}$- $\frac{x^{-\alpha}y^{-\alpha}}{y^{-\alpha}+x^{-\alpha}}$(x ∈ C, y ∈ C, z ∈ C, x, y, z are not equal each other, and x, y, z is not equal to 1). f(α)=f(-α)=0(α=-n,n $\in Z^+$ and $n \geq 1)$)indicates that fermat diophantine equation $x^n + y^n = z^n$ ($x \in C, y \in C, z \in C$, and x, y, z is not equal to 1, $n \in Z^+$ and $n \geq 1)$ solution of x, y, z values have symmetry. The values of the elements in a complex number set are symmetrical, such as when the real and imaginary parts are opposite to each other, or when the real parts are the same but the imaginary parts are opposite to each other. The values of the elements in the set of real numbers also have symmetry and are not as good as the opposite real numbers with equal absolute values. The values of the elements in an integer set are also symmetrical, not as symmetrical as those of opposite integers with equal absolute values. However, the values of the elements in a set of positive integers do not have symmetry. So when $n \in Z^+$ and$n \geq 3$, the solutions x,y, and z of the Fermat indefinite equation $x^n + y^n = z^n$ ($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, n∈Z+ and n≥3) can not all be positive integers that are not equal to each other and not 1. But when $n \in Z^+$ and $1 \leqq n \leqq 2$, $x + y = z$($x \in Z^+, y \in Z^+, z \in Z^+$, and x, y, z is not equal to 1, $n \in Z^+$ and n=1) and $x^2 + y^2 = z^2$ ($x \in Z^+, y \in Z^+, z \in Z^+$, and x, y, z is not equal to 1, $n \in Z^+$ and n=2) can be regarded as the length values of the three line segments on a straight line and the length values of the two right-angled sides and the hypotenuse in a right-angled triangle inscribed within a circle. The length value is a scalar and does not need to be symmetrical. When $n \in Z^+$ and n≥3, the values of x,y, and z in the curve equation f(x,y,z)=$x^n + y^n - z^n$ ($x \in C, y \in C, z \in C$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$and n≥3) can only be regarded as the coordinate values of any point P on the curve Coordinate values are used to represent positions in space, so coordinate values are symmetrical. Therefore, the Ferma index-equation $x^n + y^n = z^n$ ($x \in Z^+, y \in Z^+, z \in Z^+$,the solutions x,y, and z are not equal to each other, and none of them are equal to 1), For $n \in Z^+$and n≥1, the solutions x,y, and z can not all be equal to each other and none of them are positive integers 1.

The Fermat's Last Theorem conjecture itself stipulates that in the indefinite equation $x^n + y^n$=z^n($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, $n \in Z^+$ and $n \geq 3$), the independent variables x,y, and z are all positive integers, and x,y, and z are all unequal, x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$. Obviously, if this rule is violated, then the indeterminate equation $x^n + y^n$=z^n($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, $n \in Z^+$ and $n \geq 3$)has no positive integer roots, x,y, and z must all be mutually unequal positive integers,none of x ,y , or z can be real numbers, rational numbers, or complex numbers, α is always itself at any time. Since I have already assumed that α=-n($n \in Z^+$ and $n \geq 1$), I will replace α with -α, and -α is n. Replacing α with -α is to apply $x^{-\alpha} + y^{-\alpha} = z^{-\alpha}$ ($\alpha \in Z$, α=-n, $n \in Z^+$ and $n \geq 1$,$x \in C, y \in C, z \in C$, x, y, and z are not
equal to each other, and x, y, z is not equal to 1).Suppose α=-n(($\alpha \in Z$, $n \in Z^+$ and $n \geq 1$),then -α=n($\alpha \in Z, n \in Z^+$ and $n \geq 1$). Most mathematicians believe that the Fermat indeterminate equation has no positive integer solution when x,y, and z are all positive integers, x,y, and z is not equal to 1, and n≥3($n \in Z^+$). To prove its validity, I apply the method of proof by contradiction. I first assumed that the Fermat indeterminate equation$x^n + y^n$=z^n($x \in Z^+, y \in Z^+, z \in$
Z^+, x, y, and z are not equal to other, and x, y, z is not equal to 1, $n \in Z^+$ and $n \geq 3$)has a positive integer solution.However, when it is assumedthat the Fermat indeterminate equation $x^n + y^n$=z^n($x \in Z^+, y \in Z^+, z \in$
Z^+, x, y, and z are equal to each other, and x, y, z is not equal to 1, $n \in Z^+$ and $n \geq 3$)has a positive integer solution a conclusion will be reached: z^2=xy($x \in C, y \in C, z \in$
$C, x, y, and\ z\ are\ not\ equal\ to\ each\ other, andx, y, z\ is$ equal to 1, $n \in Z^+$ and $n \geq 1$).In order to
prove when z^2=xy($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and C, x, y, an
x, y, z is not equal to 1 , $n \in Z^+$ and $n \geq 1$), $x^n + y^n = z^n$ ($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are *not equal to each other*, *andx*, *y*, *z is* not equal to 1, z^2=xy , $n \in Z^+$ and n ≥1) can not hold be true，application $x^2 + y^2$=z^2($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other z is not equal to 1, n=2). It must have a positive integer, such as $3^2 + 4^2$=5^2. and According

to the $x^2+y^2=z^2(x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,n=2), it is easy it is easy to get $z^2>xy(x\in R, y\in R, z\in R, x, y, andzarenotequaltoeachother, andx, y,$ z is not equal to 1,n=2), it is impossible for $z^2=xy($ $x\in C, y\in C, z\in C$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,n=2).

According to $z^2=xy(x\in C, y\in C, z\in C$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,n $\in Z^+$ and n≥1), then x+y=z($x\in R, y\in R, z\in R$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, n=1) can not have a positive integer solution. Because according to $z^2=xy(x\in C, y\in C, z\in C$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, n $\in Z^+$ and n≥1), then z=$\sqrt{xy}$($x\in R, y\in R, z\in R$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, $n=1$), then x+y=$\sqrt{xy}$($x\in R, y\in R, z\in R$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,$n=1$), then $x^2+y^2+2xy=xy($ $x\in R, y\in R, z\in R$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, $n=1$),

then $(x+\frac{y}{2})^2+\frac{3}{4}=0($

$x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,$n=1$),

obviously $(x+\frac{y}{2})^2+\frac{3}{4}=0($

$x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,$n=1$) has no real solution. $z^2>xy($ $x\in R, y\in R, z\in R$, x, y, and z are not equal to each other, and x, y, z is not equal to ,n=2) is completely by $x^2+y^2=z^2($ $x\in R, y\in R, z\in R$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,n=2) has long been determined and can not become $z^2=xy($ $x\in C, y\in C, z\in C$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, n $\in Z^+$ and n≥1) after n≥3(n $\in Z^+$). It is incorrect to assume that the Fermat indeterminate equation $x^n+y^n=z^n($ $x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,and $n\in Z^+$ and $n\geq 3$) has a positive integer solution. It is precisely because of this invalid assumption that the erroneous conclusion $z^2=xy$ ($x\in C, y\in C, z\in C$, x, y, and z are not equal to each other, and x, y, z is not equal to 1,n $\in Z^+$ and n≥1) was produced. That is to say, for the Fermat indeterminacy equation $x^n+y^n=z^n($ $x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, z is not equal to 1, n $\in Z^+$ and $n\geq 3$)has no positive integer solutions that are not equal to 1. Therefore, the Fermat's Last Theorem conjecture can hold be true.

There is always a condition that makes it valid and feasible to replace a with -a. The key point is that there are no mutually equal and non-equal positive integer solutions to Fermat's indefinite equation $x^n+y^n=z^n(x\in Z^+, y\in Z^+, z\in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$).After replacing a with -a, I used $x^{-\alpha} + y^{-\alpha} = z^{-\alpha}$($\alpha \in Z$, $-\alpha = n$， $n \in Z^+$ and $n \geq 1, x \in C, y \in C, z \in C$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1).It is equivalent to solving the system of equations composed of equations

$x^n + y^n = z^n$(x,y, $x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 3$) and $z^{-\alpha} = \frac{x^{-\alpha}y^{-\alpha}}{y^{-\alpha}+x^{-\alpha}} = \frac{x^{-\alpha}y^{-\alpha}}{z^{-\alpha}} = (\frac{xy}{z})^{-\alpha}$($\alpha \in Z, -\alpha = n, n \in Z^+$ and $n \geq 1, x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1 ,the final solution (x,y,z) should be consistent with the solution of $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 1$)， x,y, and z should all be positive integers that do not equal 1.It does not hold true that Fermat's indefinite equation $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 3$) has unequal positive integer solutions that are not equal to 1, because what is actually correct is that $x^n + y^n \neq z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1,$n \in Z^+$ and $n \geq 3$) has unequal positive integer solutions that are not equal to 1. If $x^n + y^n \neq z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$) is used, then it will not be $z^2 = xy$($x \in C, y \in C, z \in C$, x,y,z are not equal to each other, and x,y,z are not equal to 1, $n \in Z^+$ and $n \geq 1$), but will be another result. This result can ensure that the operation of replacing a with -a is correct and feasible, but x,y,z cannot be positive integer solutions that are not equal to each other and not equal to 1. I don't need to care about that other result anymore. The specific outcome depends on how x,y, and z take their values. Because $z^2 > xy$($x \in R, y \in R, z \in R$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$), so $z^2 = xy$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$) can not hold be true .

Because according to $z^2 = xy$($y \in C, z \in C$, x, y, z are not equal each other , and x, y, z are not equal to 1, $x \in Z^+$and n≥1), then z=$\sqrt{xy}$ ($x \in R, y \in R, z \in R$, and x, y, z is not equal to 1, $n \in Z^+$ and n = 2), then the $x^2 + y^2 = xy$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, z are equal, and x, y, z is not equal to 1, n = 1), then $(x - \frac{y}{2})^2 + \frac{3}{4}y^2 = 0$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, z are equal, and x, y, z is not equal to 1, $n \in Z^+ n = 1$), obviously $(x - \frac{y}{2})^2 + \frac{3}{4}y^2 = 0$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y,z are not equal to each other, and x,y,z are not equal to 1. $n \in Z^+$ and n=1) has no positive integer roots. $z^2 > xy$($x \in R, y \in R, z \in R$,x, y, z are not equal to each other, and x, y, z is not equal to 1, $n \in Z^+$and n = 2) is completely early confirmed by $x^2 + y^2 = z^2$($x \in Z^+, y \in Z^+, z \in Z^+$, x , y, z are not equal to each other , and x, y, z is not equal to 1, $n \in Z^+$ and n = 2), can't becomes the $z^2 = xy$($x \in Z^+, y \in Z^+, z \in Z^+$,x , y, z are not equal to each other, and x, y, z is not equal to 1) after $n \geq 3(n \in Z^+)$. It is incorrect to assume that the Fermat indeterminate equation $x^2 + y^2 = z^2$ ($x \in Z^+, y \in Z^+, z \in Z^+$, x,y,z are not equal to each other, and x,y,z are not equal to 1, $n \in Z^+$ and n=2) has a positive integer solution. It is precisely because of this invalid assumption that the conclusion z^2=xy($x \in C, y \in C, z \in C$, x,y,z are not equal to each other, and x,y,z are not equal to 1, $n \in Z^+$ and n≥1) was produced.

Suppose that the Ferma indefinite equation $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, and x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$) has a positive integer does not hold be true.Then, conversely, the Fermat's indefinite equation $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$) can hold be true only when there are no positive integer solutions that are not equal to each other and not equal to 1. So the Fermat's Last Theorem conjecture can hold be true.

There is always a condition that makes it valid and feasible to replace a with -a. The key point is that there are no mutually equal and non-equal positive integer solutions to Fermat's indefinite equation $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$).After replacing a with -a, I used $x^{-\alpha} + y^{-\alpha} = z^{-\alpha}$($\alpha \in Z$, $-\alpha = n$, $n \in Z^+$ and $n \geq 1, x \in C, y \in C, z \in C$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1).It is equivalent to solving the system of equations composed of equations $x^n + y^n = z^n$(x,y, and z are all positive integers, x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$) and $z^{-\alpha} = \frac{x^{-\alpha}y^{-\alpha}}{y^{-\alpha}+x^{-\alpha}} = \frac{x^{-\alpha}y^{-\alpha}}{z^{-\alpha}} = (\frac{xy}{z})^{-\alpha}$($\alpha \in Z$, $-\alpha = n, n \in Z^+$ and $n \geq 1, x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z not equal to 1) ,the finalsolution (x,y,z) should be consistent with the solution of $x^n + y^n = z^n$($n \in Z^+$ and $n \geq 1, x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1) , x,y, and z should all be positive integers that do not equal 1. It does not hold true that Fermat's indefinite equation $x^n + y^n = z^n$($n \in Z^+$ and $n \geq 3$,($x \in Z^+, y \in Z^+, z \in Z^+$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1) has unequal positive integer solutions that are not equal to 1, because what is actually correct is that

$x^n + y^n \neq z^n$($n \in Z^+$ and $n \geq 3, x \in Z^+, y \in Z^+, z \in Z^+$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1) has unequal positive integer solutions that are not equal to 1.If $x^n + y^n \neq z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$) is used, then it will not be z^2=xy($x \in C, y \in C, z \in C$, x,y,z are not equal to each other, and x,y,z are not equal to 1, $n \in Z^+$ and $n \geq 1$), it will be $z^2 \neq$xy($x \in C, y \in C, z \in C$, x,y,z are not equal to each other, and x,y,z are not equal to 1, $n \in Z^+$ and $n \geq 1$). This result can ensure that the operation of replacing a with -a is correct and feasible, but x,y,z cannot be positive integer solutions that are not equal to each other and not equal to 1. Suppose that the Ferma indefinite equation $x^n + y^n = z^n$($x \in Z^+, y \in Z^+, z \in Z^+$, and x,y, and z are not equal to each other; and x,y, and z are not equal to 1, $n \in$

Z^+ and $n \geq 3$) has a positive integer solution that is not equal to each other and not equal to 1 can not hold true. Then, conversely,the Fermat's indefinite equation $x^n + y^n = z^n$ ($x \in Z^+, y \in Z^+, z \in Z^+$,x,y, and z are not equal to each other, and x,y, and z are not equal to 1, $n \in Z^+$ and $n \geq 3$) can hold be true only when there are no positive integer solutions that are not equal to each other and not equal to 1. The Fermat's Last Theorem conjecture can holds be true.

When z^2=xy(
$x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to $1, n \in Z^+$ and $n \geq 1$，x≠0，y≠0) ,that is, when $z^n = x^{\frac{n}{2}} y^{\frac{n}{2}}$($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to $1, n \in Z^+$ and $n \geq 1$x≠0,y≠0),suppose $\frac{x^{\frac{n}{4}}}{y^{\frac{n}{4}}}$=u($x \in C, y \in C, z \in C$, x, y, and z are not equal to each to other, and x, y, and z are not equal to 1, $n \in Z^+$ and $n \geq 1$,x≠y≠0) and $\frac{x^{\frac{n}{4}}}{y^{\frac{n}{4}}}$=v($x \in C, y \in C, z \in C$, x, y, and z are not equal to each other, and x, y, and z are not equal to $1, n \in Z^+$ and $n \geq 1$, x≠0,y≠0),then there is $u^2 + v^2 = 1$, which is an equation for a unit circle. We can also transform the equation of this unit circle into an elliptic equation, which is $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$(where a is the major half-axis and b is the minor half-axis). Since both u and v in this circular equation $u^2 + v^2 = 1$ and this elliptic equation $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$(where a is the major half-axis and b is the minor half-axis) are complex numbers with imaginary numbers or real and rational numbers, the elliptic equation $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$(where a is the major half-axis and b is the minor half-axis) represents three in a four-dimensional complex number space Elliptic curves in dimensional elliptic surfaces or elliptic curves in two-dimensional elliptic surfaces in three-dimensional space. According to n=1,2,3,... ,N,... (n∈Z+ and n≥1), for this type of ellipse, $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$(where a is the major half-axis and b is the minor half-axis, $z^2 = xy$ or $z^2 < xy$) and $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$(where a is the major half-axis and b is the minor half-axis,$\sqrt{xy} < z \leqq \sqrt{2xy}$) and $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$

($\sqrt{xy} < z \leqq \sqrt{2xy}$) and $\frac{u^2}{a^2} + \frac{v^2}{b^2} = 1$(where a is the major half-axis and b is the minor half-axis, and $z^2 > 2xy$) are consistent with the Fourier expansion sequence in modular forms in mathematics. It is indicated that all elliptic curves of three-dimensional elliptic surfaces in the complex number field of a four-dimensional complex number space are modular, and the conjecture by Toyotomi Taniyama and Goro Shimura that all elliptic curves in the rational number Q field are modular is also correct. $u^2 + v^2 = 1(z^2 = xy$ or $z^2 < xy)$ and $u^2 + v^2 = 1(\sqrt{xy} < z \leqq \sqrt{2xy})$ and $u^2 + v^2 = 1(z^2 > 2xy)$ represent circular curves in a three-dimensional sphere in a four-dimensional complex space or in a two-dimensional surface in a three-dimensional space. The elliptic curves of compact, simply connected three-dimensional elliptic surfaces in the complex number field of four-dimensional complex number space and the circular curves of compact, simply connected three-dimensional spheres in the complex number field of four-dimensional complex number space are homotopy, respectively with the compact, simply connected three-dimensional elliptic surfaces in the complex number field of four-dimensional complex number space and the compact, simply connected three The dimensional sphere is homeomorphic, so the Poincare conjecture about compact, simply connected closed curves in the three-dimensional sphere of the complex field in the four-dimensional complex space holds true.

Method 2:

Ferma's last theorem says that equation $x^n+y^n=z^n$ ($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n\in Z^+, n>2$) has no positive integer solution,accordingto $(x+y)^n=z^n$ ($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n\in Z^+, n>2$), according to the Pythagorean theorem, we can wait until the $x^2+y^2=z^2$ ($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n\in Z^+$) was established, if $x^{n-2}=y^{n-2}=z^{n-2}$($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, x, y, and z are not equal to 1, $n\in Z^+, n>2$), that we can get the $x^2x^{n-2}+y^2y^{n-2}=z^2z^{n-2}$($x\in Z^+, y\in Z^+, z\in Z^+$, x , y, and z are not equal to each other, and x, y, and z are not equal to 1 , $n\in Z^+, n>2$), then the equation $x^2x^{n-2}+y^2y^{n-2}=z^2z^{n-2}$($x\in Z^+$, $y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1,$n\in Z^+, n>2$) and equation $x^2+y^2=z^2$($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1 , $n\in Z^+$) have the same positive integer solutions.In fact,because when x, y, and z are not equal to each other, *and x, y and z* are not equal to 1, then $x^{n-2}=y^{n-2}=z^{n-2}$ ($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $x\neq y\neq z\neq 1, n\in Z^+$) can not be true. In turn, because $x\neq y\neq z$, therefore, $x^{n-2}\neq y^{n-2}$、$y^{n-2}\neq z^{n-2}, z^{n-2}\neq x^{n-2}$, then the equation $x^2x^{n-2}+y^2y^{n-2}= z^2z^{n-2}$($x\in Z^+$, $y\in Z^+, z\in Z^+$, x, y and z are not equal to each other, and x, y, and z are not equal to 1, $n\in Z^+$) and equation $x^2+y^2=z^2$($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, *and x, y, and z are* not equal to 1,$n\in Z^+$, and , $n>2$) will not have any positive integer solutions, and $x^2x^{n-2}+y^2y^{n-2}=z^2z^{n-2}$($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, *and x, y, and z are* not equal to 1,$n\in Z^+$, $n>2$) will not have any integer solutions, so fermat theorem suppose $x^n+y^n=z^n$($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n\in Z^+$, and $n>2$) has no integer solutions can hold be true.

Method 3:

Ferma's last theorem says that equation $x^n+y^n=z^n$($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1 , $n\in Z^+$, and $n>2$) has no positive integer solution, according to $(x+y)^n=z^n$ ($x\in Z^+, y\in Z^+, z\in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1,$n\in Z^+$, and , $n>2$), when $(x+y)^n=x^n+ j_1\ u^{p-k-h(i)}v^{p-k-g(j)}+j_2\ u^{p-k-h(i)}v^{p-k-g(j)}+\ldots+j_k\ u^{p-k-h(i)}v^{p-k-g(j)}+\ldots+y^n>z^n$($x\in Z^+, y\in Z^+, z\in$

Z^+, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $k \in Z^+$, $j_1 \in Z$, $j_2 \in Z$, ..., $j_i \in Z$, $i \in Z^+$, $h(i) \in Z$, $j \in Z^+$, $g(j) \in Z$, $n \in Z^+$, $n > 2$).

if $x^n+y^n=z^n$($x\in Z^+, y \in Z^+, z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, $n \in Z^+$, and $n > 2$) has a positive integer solution, then $x+y \neq z$, and x+y>z,otherwise it would be wrong and contradictory.When $x^p+y^p=z^p$ ($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and *z are not equal to each* other, and x, y, and z are not equal to 1, p is any prime number, p≥3),suppose $x^p+y^p=z^p$($x\in Z^+, y \in Z^+, z \in Z^+$, x, y, and *z are not equal to* each other, and x, y, and z are not equal to 1, p is any prime number, $p \geq 3$) has a positive integer solution when p is any prime,then because $2^px^p+2^py^p=2^pz^p$ ($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and *z are not equal to each* other, and x, y, and z are not equal to 1, p is any prime number ,$p \geq 3$),when $2x=u+v$($x \in Z^+, u \in Z^+, v \in Z^+, u > 3, v > 1$) *and* $2y=u-v$ ($y \in Z^+, u \in Z^+, v \in Z^+, z \neq 1, u > 3, v > 1$), so let's put $2x=u+v$($x\in Z^+, u \in Z^+, v \in Z^+$, $u > 3, v > 1$) and $2y=u-v$ ($y \in Z^+, u \in Z^+, v \in Z^+, u > 3, v > 1$) into $2^px^p+2^py^p=2^pz^p$($x \in Z^+, y \in Z^+, z \in Z^+$, x, y, and *z are not equal to each* other, and x, y, and z are not equal to 1, p is any prime number, $p \geq 3$), so

$(2u)(u^{p-1}+ j_1u^{p-3}v^{p-3}+j_2u^{p-4}v^{p-4}+\ldots+j_ku^{p-k-h(i)}v^{p-k-g(j)}+\ldots+pv^{p-1})=(2z)(2z)^{p-1}$

(p is any prime number, $p \geq 3$, $k\in Z^+$, $u \in Z^+$, $v \in Z^+$, $j_1 \in Z$, $j_2 \in Z$, ..., $j_k \in Z$, $i \in Z^+$, $h(i) \in Z$, $j \in Z_+$, $g(j) \in Z$, $u \in Z^+$, $v \in Z^+$, $u > 3, v > 1$),then

$(u)(u^{p-1} + j_1 u^{p-3}v^{p-3}+ j_2 u^{p-4}v^{p-4}+\ldots+ j_k u^{p-k-h(i)}v^{p-k-g(j)}+\ldots+pv^{p-1})=(z)(2z)^{p-1}=(z)(2)^{p-1}(z)^{p-1}$(p is any prime number, $p \geq 3$, $k\in Z^+$, $j_1 \in Z, j_1 \in Z, j_2 \in Z, \ldots, j_k \in Z, i \in Z^+$, $h(i) \in Z, j \in Z^+$, $g(j) \in Z, u \in Z^+, v \in Z^+, u > 3, v > 1$), since u is a positive integer product factor of the value on the right-hand side of the equation,and because u and z are variables, not constants, and $u > 3$, *so* $u = z$ *or* $u \geq (2z)$ or $3 < u < z$. When $u \geq 2z$, then $2x=u+v \geq 2z +v$, then $x> z$, then $x^p+y^p>z^p$ ($x\in Z^+, y \in Z^+, z \in Z^+$, x, y, and *z are not equal to each* other, and x, y, and z are not equal to 1, *p is any rime* number, $p \geq 3$),then $x^p+y^p=z^p$ ($x\in Z^+, y \in Z^+, z \in Z^+$, x, y, and *z are not equal to each* other, and x, y, and z are not equal to 1, *p is any prime* number $p \geq 3$),has no positive integer solution. So let's just think about u=z and $3 < u < z$.When u=z,then $(u^{p-1}+ j_1u^{p-3}v^{p-3}+j_2u^{p-4}v^{p-4}+\ldots+j_ku^{p-k-h(i)}v^{p-k-g(j)}+\ldots+pv^{p-1})=(2)^{p-1}(z)^{p-1}$

(p is any prime number, $p \geq 3$, $k \in Z^+$, $u \in Z^+$, $v \in Z^+$, $j_1 \in Z, j_2 \in Z, \ldots, j_k \in Z$, iZ^+, $h(i) \in Z$, $j \in Z^+$, $g(j) \in Z$, $u \in Z^+$, $v \in Z^+$, $u > 3, v > 1$). And

$2(x + y)= (u + v)+ (u - v)$, then u=x+y, according to u=z, then x+y=z . When x+y=z, then $(x + y)^p =z^p$, then $x^p+y^p<z^p$(p is any prime number, $p \geq 3$, $k\in Z^+$, $u \in Z^+$, $v \in Z^+$, $j_1 \in Z, j_2 \in Z, \ldots, j_k \in Z, i \in Z^+$, $h(i) \in Z$, $j \in Z_+$, $g(j) \in Z$, $u \in Z^+$, $v \in Z^+$, $u > 3, v > 1$),so $x^p+y^p=z^p$ (p is any prime number, $x^p+y^p=z^p$ (p is any prime number, $p \geq 3$, $k \in Z^+$, $u \in Z^+$, $v \in Z^+$, $j_1 \in Z, j_2 \in Z, \ldots, j_k \in Z, i \in Z^+$, $h(i) \in Z$, $j \in Z^+$, $g(j) \in Z$, $u \in Z^+$, $v \in Z^+$, $u > 3, v > 1$) has no positive integer solution, this contradicts the previous assumption that $x^p+y^p=z^p$(*p is any prime number*, $p \geq 3$, $k \in Z^+$, $u \in Z^+$, $j_1 \in Z, j_2 \in Z, \ldots, j_k \in Z, i \in$

Z^+, $h(i) \in Z$, $j \in Z_+$, $g(j) \in Z$, $u \in Z^+$, $v \in Z^+$, $u > 3, v > 1$) has positive integer solutions, and when $3 < u < z$, then according to u=x+y, then x+y<z ,and when x+y<z, then $(x + y)^p < z^p$,then $x^p+y^p<z^p$(p is any prime number, $p \geq 3$, $k \in Z^+$, $u \in Z^+$, $v \in Z^+$, $j_1 \in Z$, $j_2 \in Z$, ... , $j_k \in Z$, $i \in Z^+$, $h(i) \in Z$, $j \in Z^+$, $g(j) \in Z$, $u \in Z^+$, $v \in Z^+$, $u > 3, v > 1$) ,equal to so $x^p+y^p=z^p$ (*p is any prime* $p \geq 3$,$x\in Z^+$, $y \in Z^+$, $z \in Z^+$, x, y, and so $x^p+y^p=z^p$(z *are not* each other, and x, y, and z are not equal to 1) has no positive integer solution, this contradicts the previous assumption that $x^p+y^p=z^p$($x\in Z^+$, $y \in Z^+$, $z \in Z^+$, x, y, and *z are not* equal to each other, *andx, y, and* z are not equa l to 1 , p is any prime number, p≥3) has positive integer solutions.

Therefore, it is wrong to assume that if p is a prime number, then $x^p+y^p=z^p$($x \in Z^+$, $y \in Z^+$, $z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1,p is any prime number, p≥3) has a positive integer solution,so for any prime number p, $x^p+y^p=z^p$($x\in Z^+$, $y \in Z^+$, $z \in Z^+$, x, y, and z are not equal to each other, and x, y, and z are not equal to 1, p is any prime number, $p \geq 3$) has no positive integer solutions.So the fermat equation $x^n+y^n=z^n$($x\in Z^+$, $y \in Z^+$, $z \in Z^+$, x, y, and *zare not* equal to each other, and x, y, and z are not equal to 1 , $n \in Z^+$, and $n > 2$) has no positive integer solutions.

The Proof of Mersenne's prime conjecture

Proof

If 2^n-1($n \in Z^+$,) is a prime number, then n is also a prime number. This can be proved by proof by contradiction:

If n is not a prime number, then there exist two positive integers a and b that are greater than 1 and less than n, and b satisfies n=ab.So

2^a=

= 2^{ab}-1

=$(2^a)^b$ -1 (let y=2^a)

=$(y)^b$ -1

=(y-1)(y^{b-1}+y^{b-2}+...+y+1).

It is easy to see that in the above formula, y-1 and y^{b-1}+y^{b-2}+...+y+1 is not equal to 1 , otherwise if y - 1 = 1, y = 2, i.e. 2^a = 2, is there will be a = 1, contradicts to a > 1; if y^{b-1}+y^{b-2}+...+y+1=1, then y=0, which contradicts to y=2^a>2(a>1). Therefore, y-1 and y^{b-1} + y^{b-2} +...+y+1 are both positive integers greater than 1, that is, they are two product factors of 2^n-1, and the are all greater than 1, which contradicts to 2^n-1 is a prime number.So if 2^n-1 is a prime number, then n is also a prime number.

Assume that only a finite number of primes p_i make $2^{p_i} - 1$ can become a prime number, now construct

Q=$2^{2k}(2^{p_i}$)-1=2^{2k+p_i}-2^{2k}+2^{2k}-1=$2^{2k}(2^{p_i} - 1)+(2^k + 1)(2^k - 1)$($i\in Z^+$, $k\in Z^+$). Because of having an infinite number of prime number, so $2k + p_i$($i \in Z^+$, $k \in Z^+$) can always is a prime number, assuming $p_j = 2k + p_i$($i \in Z^+$, $j \in Z^+$, $k \in Z^+$) . When $k \neq p_i$($i \in Z^+$, $k \in Z^+$) , because $2^{2k}(2^{p_i}$)-1 can not be divisibled by all primes less than $2^{2k}(2^{p_i}$)-1, according to the definition of prime Numbers, so when $k\neq p_i$($i \in Z^+$, $k \in Z^+$), then $2^{p_j} - 1 = 2^{2k}(2^{p_i}$)-1 is a prime number, this contradicts the previous assumption, so there are not only a finite number

of prime numbers p_i that make $2^{p_i}-1$ prime， so there are an infinite number of prime numbers p_i make $2^{p_i}-1(i\in Z^+)$
can be a prime number. Below I to prove this,

assuming $2^{2k}=2u=2^nP_m(k\in Z^+, u\in Z^+, m\in Z^+,\ n\in Z^+)$, First take all the primes, and then take any number of primes from all the primes, allow to repeat any number of the same prime number, also allow to repeat any number of prime numbers, and then multiply all these obtained primes, their product is represented by P_m. So $2^{2k}(2^{p_i}-1)+2^{2k}$-1($i\in Z^+, k\in Z^+$) cannot be divided exactly by 2 and all primes of a prime. Obviously $2^{2k}(2^{p_i}-1)+2^{2k}$ -1> $2^{p_i}-1$ ($i\in Z^+$, $k\in Z^+$), at the same time $2^{2k}(2^{p_i}-1)+2^{2k}$-1>P_j
($i\in Z^+, k\in Z^+, j\in Z^+$), P_j is the 'largest' prime of all primes.According to the definition of a prime number, a positive integer that is not evenly divided by 2 and any of the prime numbers must be a prime number, So $2^{2k}(2^{p_i}-1)+2^{2k}$-1($i\in Z^+, k\in Z^+$) must be a prime number, ($2^{p_i+2k}-1$) ($i\in Z^+, k\in Z^+$) must also be a prime number. This contradicts the previous assumption that there are only a finite number of Mersenne primes; there are obviously more Mersenne primes than $2^{p_i}-1(i\in Z^+)$. So it is wrong to assume that there are only a finite number of Mersenne primes, or that there is a maximum number of Mersenne primes.Since primes of the form $2^{p_i}-1(i\in Z^+$, p_i is prime) are called Mersenne primes, there are an infinite number of Mersenne primes and the Mersenne conjecture holds. Suppose there is any odd number O_j, then any even number E= O_j+1. Hypothesis $2u=2^nP_m(k\in Z^+, u\in Z^+, m\in Z^+,\ n\in Z^+)$, P_m for any odd,$O_j=2u+1(u\in Z^+)$,thenE=O_j+1=$(2u+1)+1$=$[(2^n\times(p_1)^{n_1}\times(p_2)^{n_2}\times(p_3)^{n_3}\times\ldots\times(p_i)^{n_i}\times\ldots)+1]+1$ $(p_1、p_2、p_3、p_4、\ldots、p_k、\ldots、p_i、\ldots\in Z^+, n_1、n_2、n_3、n_4\ldots、n_i、\ldots\in Z^+, u\in Z^+, i\in Z^+)$, $p_1、p_2、p_3、p_4、\ldots、p_k、\ldots、p_i、\ldots$ represents all prime numbers.Then $E=O_j+p_q=(2u+1)+p_q=[(2^n\times(p_1)^{n_1}\times(p_2)^{n_2}\times(p_3)^{n_3}\times\ldots\times(p_i)^{n_i}\times\ldots)+1]+p_q(q\in Z^+)$, p_q is a prime number, or $E=O_j+1$=($2u+1$)+1=[$(2^n\times(p_1)^{n_1}\times(p_2)^{n_2}\times(p_3)^{n_3}\times\ldots\times(p_i)^{n_i}\times\ldots)+1$] + 1- p_k+p_k =[$(2^n\times(p_1)^{n_1}\times(p_2)^{n_2}\times(p_3)^{n_3}\times\ldots\times(p_k)^{n_k}\times\ldots\times(p_i)^{n_i}\times\ldots)-1]\times p_k$ + (p_k +1+1), [$(2^n\times(p_1)^{n_1}\times(p_2)^{n_2}\times(p_3)^{n_3}\times\ldots\times(p_k)^{n_k}\times\ldots\times(p_i)^{n_i}\times\ldots)-1$] can't be divided exactly by any one of all the prime Numbers primes, So according to the definition of a prime number, cannot be divided exactly by any prime positive integers must be prime Numbers, so $[(2^n\times(p_1)^{n_1}\times(p_2)^{n_2}\times(p_3)^{n_3}\times\ldots\times(p_k)^{n_k}\times\ldots\times(p_i)^{n_i}\times\ldots)-1]$ must be a prime number, denoted by $p_j(j\in Z^+)$, if (p_k+1+1) is a prime number, which we denote by $p_v(v\in Z^+)$, then for any sufficiently large even number E, assuming that E is greater than the product of all primes, then any sufficiently large even number E can be expressed as the sum of the product of one prime p_j and the other prime p_q, or any sufficiently large even number E can be expressed as the sum of the product of one prime $p_v(v\in Z^+)$ and two other primes $p_j(j\in Z^+)$ and $p_k(k\in Z^+)$, is $E_j=O_j+1$=$(2u+1)$+1= $p_j\times p_k+p_v$. Or (p_k+1+1) is an odd number, and Suppose that when p_k is added, (p_k+1+1) must be represented only by the product of two

primes, one of which is $p_g(g \in Z^+)$ and the other by $p_r(r \in Z^+)$. p_1、p_2、p_3、p_4、…、p_k、…、p_i、… Representing all primes, then any sufficiently large even number E can be expressed as the sum of the product of a prime $p_r(r \in Z^+)$ and two other primes $p_j(j \in Z^+)$ and $p_g(g \in Z^+)$, is also

$E=O_j+1=(2u+1)+1=[(2^n \times (p_1)^{n_1} \times (p_2)^{n_2} \times (p_3)^{n_3} \times \ldots \times (p_k)^{n_k} \times \ldots \times (p_i)^{n_i} \times \ldots)-1] \times p_g + p_g p_r = [(2^n \times (p_1)^{n_1} \times (p_2)^{n_2} \times (p_3)^{n_3} \times \ldots \times (p_k)^{n_k} \times \ldots \times (p_i)^{n_i} \times \ldots)-1] \times p_g + (p_g - 1) \times p_r + p_r = (p_j \times p_g) + p_r \; (j \in Z^+, g \in Z^+, r \in Z^+)$.

The proof of the Poincare Conjecture

Proof: If there is any Angle ∠A, take the vertex of Angle A as the center of the circle, and draw an arc with any length R as the radius, the two rays intersecting Angle A are at two points B and C. And respectively B, C two points as the center of the circle, with the same arbitrary length L as the radius of the arc. Two arcs intersect at point P, connect two points A and P with a non-scale rule, get a straight line AP, intersection arcs $\overline{BC}$ is at point Q, so ∠QAB=∠CAQ. Then use the ungraduated straightedge to connect B and C, point A as the center of the circle, the length R of line segment AB as the radius of the arc, point C as the center of the circle, the length m of line segment BC as the radius of the arc, the two arcs intersect at point D, use the ungraduated straightedge to connect two points C and D and two points A and D, the line segment CD and AD are obtained. For ΔACD and ΔQAC, AD=AQ,CD=CQ,AC=CA, so the triangles ΔACD and ΔQAC are identical, so ∠DAC=∠CAQ. For

ΔDAC and ΔQAB, AD=AB,BQ=CD,QB=CD, so ΔDAC and ΔQAB are identical, so ∠DAC=∠QAB=∠CAQ, so the line AP and AC divide ∠BAD into three equal parts. Since ∠BAC is an arbitrary Angle, ∠BAD is also an arbitrary Angle, and each bisecting Angle ∠DAC, ∠CAQ, and ∠QAB are also arbitrary angles. Therefore, the three equal points of any Angle exist, and the three equal points of any Angle can also be made indirectly by using a non-graduated ruler and a compass.

In fact, all curvatures, including the series composed of many curvatures, which are also called curvature flows, are originated from the "flow number" proposed by Newton when he founded calculus. The origin of the concept of slope of a point on a curve is also the "flow number" proposed by Newton when he founded calculus. The curvature of the curve corresponds to any two adjacent points on the transcurve L(note: the curve is also called an arc, called a manifold in topology), assuming that the two adjacent points are M and M', respectively, the tangent lines L_1 and L_2 of their outer tangent circles, and the two tangent lines intersect. Suppose that the smaller Angle between the two tangents L_1 and L_2 is called the outer tangential Angle β, and the larger Angle between the two tangents L_1 and L_2 is called the outer tangential Angle β', obviously $\beta+\beta'=\pi$ radians, because they are collinear. Join M and M' to get the line MM'. Suppose that the Angle between tangent L_1 and line segment MM' through M, that is, the direction Angle between tangent L_1 and line segment MM', also called the Angle between tangent L_1 and line segment MM', denoting its magnitude as α, the Angle between tangent L_2 and line segment MM' through M', That is, the direction Angle between the tangent line L_2 and the line segment MM' is also called the tangent Angle between the tangent line L_2 and the line segment MM', and its magnitude is α'. Suppose that the length of the arc $\overline{MM'}$ of a curve L between two points M and M' is, as M' tends to M along the curve L, if there is a limit to the average curvature of the arc $\overline{M'M}$, then this limit is called the curvature of the curve L at point M, denoted K, that is $K=\lim_{M'\to M}|\frac{\Delta\alpha}{\Delta s}|$,or $K=\lim_{\Delta s\to 0}|\frac{\Delta\alpha}{\Delta s}|=|\frac{d\alpha}{ds}|$.When M approaches M' along the curve L, if the limit of the average curvature of the arc MM'exists, then K' is called the curvature of the point M' on the curve L with respect to the point M on the curve L, denoted K', that is $K'=\lim_{M\to M'}|\frac{\Delta\alpha}{\Delta s}|$,or

$K'=\lim_{\Delta s\to 0}|\frac{\Delta\alpha}{\Delta s}|=|\frac{d\alpha}{ds}|$.

It should be noted that the above two curvatures K and $K'$are often not zero, because the two points
M and M 'are not necessarily located on the same tangent circle. Poincare's conjecture states that all points on a closed manifold moving in the same direction can be reduced to a single point, and then the geometry made up of all such closed manifolds must be a sphere. When the Poincare conjecture holds, then any two adjacent points on all closed manifolds, assumed to be M and M', must be on the same outer tangent circle, and all closed manifolds must be compact and simply connected. The concept of slope on a curve is the value of the tangent of any point on the curve, such as the Angle between the tangent lines L_1 and L_2 of any point M or M' of the curve L and the horizontal X axis of the rectangular coordinate system in which it is located. Newton's "flow number" is actually a differential, and in particular the "flow number" already includes the concept of curvature and slope at any point on the curve, and also includes the concept of curvature flow and slope flow. The first meaning of the flow number is a series of numbers, Newton said "flow number" refers to the curvature of all points on the curve and the slope of all points on the curve of the series, and Newton also pointed out that the essence of the differential is the limit, the essence of the integral is the sum.

Newton has made clear the most central idea and concept of calculus, the essence of the limit is the limit of extreme values, is the value of some ultimate point.

I began to prove Poincare's conjecture:First of all, the necessary and sufficient condition for the Poincare conjecture to be true is that all closed manifolds can be converted to the curvature of all points on the closed manifolds by topological transformations. The sequence of values of all these curvatures is called the curvature flow of the closed manifold. If all closed manifolds with zero curvature flow are converted to circles, then Poincare's conjecture holds.Since any Angle can be bisected by an ungraduated ruler and compass, an Angle equal to the bisected Angle of this arbitrary Angle can be made by an ungraduated ruler and compass outside any ray of this arbitrary Angle, so any Angle can be bisected by an ungraduated ruler and compass. Because above, when I proved that there are three equal points of any Angle, I first took an arbitrary Angle, and then I divided it into two equal parts, and on the basis of the two equal parts of any Angle, I proved that I could make an Angle of half the Angle of this arbitrary Angle. So if you combine this new Angle with the original arbitrary Angle, then the number of radians of the entire Angle is 1.5 times the number of radians of the original arbitrary Angle, which is also a new Angle. Since the original angular radian is arbitrary, the radian of this new Angle is also arbitrary, and the 2 bisection angles of the original arbitrary Angle and the 3 bisection angles of the new arbitrary Angle are equal, and the radian number of each such bisection Angle is also arbitrary until it is zero. If the number of radians of each bisection of any Angle is considered as a unit, then the number of radians of any Angle is 2, which is the Angle of 2 units, and the number of radians of the new arbitrary Angle is 3, which is the Angle of 3 units. If there are P of these arbitrary angles and Q of these new arbitrary angles, then there are infinitely many of these bisecting angles. Since all non-negative integers can be written as N=2P+3Q(P, Q are non-negative integers), N can be iterated over all non-negative positive numbers. Here's how I prove it.Proof: when P and Q are zero, then N=0; If P is a non-negative integer and Q is odd, then N=2P+3Q=(2P+2Q)+Q=2(P+Q)+Q is odd; If P is a non-negative integer and Q is even, then N=2P+3Q=(2P+2Q)+Q=2(P+Q)+Q is even; So, if P and Q are non-negative integers, then N=2P+3Q=(2P+2Q)+Q=2(P+Q)+Q goes through all non-negative integers. Since all non-negative integers are either odd or even, now N=2P+3Q includes them all, so all non-negative integers can be written in the form N=2P+3Q (P, Q are non-negative integers), so any Angle can be equally divided by any infinite n (n traverses all non-negative integers).When any Angle is 360 degrees, take the common vertex O of all bisected angles as the center of the circle, draw an arc with any length as the radius R, and intersect each ray at P_1、P_2、P_{n-1}...., P_n , and connect P_1、P_2、P_{n-1}、 ... , and P_n from end to end， forms a closed manifold, then an circumference can also be equally divided by any n(n traverses all non-negative integers). Because the curvature of a curve is the rate of rotation of the tangent direction Angle of a point on the curve against the arc length, it can be defined by differentiating, indicating the degree to which the curve deviates from the straight line. It is a number that indicates the degree of curvature of a curve at a certain point. The greater the curvature, the greater the curvature of the curve, and the reciprocal of the curvature is the radius of curvature. The curvature of the curve L at a point M on it can also be understood in this way: half of the smaller pinch Angle 2α(the tangent Angle of the tangent Angle α is formed after any two adjacent points M on the closed curve L intersect the two tangents of M' (M and M' are located just on some outer tangent circle), that is, the tangent value tg(α) of the tangent Angle α. The Angle between the tangent line and the string is called the chord Angle, the Angle of the smaller Angle is called the inner chord Angle, and the Angle of the larger Angle is called the outer chord Angle. In general, the tangent Angle refers to the inner sine Angle, and the inner sine Angle plus the outer sine Angle is π radians. For the Angle between any two tangents on the circle, the absolute value of the ratio of the tangent Angle (equal to half of the outer Angle of the tangent) Δα to the change of the length Δs of arc $\overline{M'M}$(the value is called the average curvature of the arc), when the change of arc length Δs approaches zero, Its limit value is the curvature of the point $M^{'}$ on the curve L with respect to the point M on the curve L . What needs to be said is why do you want to use the smaller Angle and not the larger Angle? The answer is simply convenience. The larger Angle is called the inside Angle of the tangent line, the smaller Angle is called the outside Angle of the tangent line, and the sum of the outside Angle of the tangent line and the inside Angle of the tangent line is π radian Angle, in general, the tangent Angle refers to the outside Angle of the tangent line.Curvature is always relative, it's always a point of curvature M relative to any other point of curvature $M^{'}$, where M and $M^{'}$ are adjacent to each other, curvature is not absolute, there is no absolute curvature.

Then when any closed manifold L passes through two adjacent vertices M and $M^{'}$ of the inner positive n square of the outer tangent circle, when n(n is a non-negative integer) approaches infinity, and any vertex $M^{'}$ of the inner positive n square approaches along the curve L to another adjacent vertex M of the inner positive n square ($M^{'}$ can be either to the left of M or to the right of M), The length of the chord $|M^{'}M|$ and the arc $|\overline{M^{'}M}|$ between any two adjacent points M and M' become smaller and smaller. The smaller Angle formed by the intersection of the two adjacent vertices on the curve L that are also the tangent lines of the two adjacent vertices M and M' on the square with the positive n is also getting smaller and smaller (the tangent Angle 2α), and the half of the tangent Angle is the tangent Angle α(the tangent Angle is just twice the tangent Angle for the circle, and this is not necessarily the case for other curves). Tangent Angle alpha as the variation of Δα and arc $\overline{M^{'}M}$ as long S the variation of Δs as the absolute value of the ratio of the $|\frac{\Delta\alpha}{\Delta s}|$ also with arc $\overline{M^{'}M}$ long as change Δs tend to be zero, its limit value $K=\lim\limits_{\Delta s\to 0}|\frac{\Delta\alpha}{\Delta s}|=|\frac{d\alpha}{ds}|$ that is smaller and smaller, tending to zero, and eventually reach zero, Finally, the curvature K of point M with respect to point

$M^{'}$ becomes zero.

Conversely, when any closed manifold L passes through two adjacent vertices M and M 'of the inner positive n square of the circle, when n(n is a non-negative integer) approaches infinity, and any vertex M of the inner positive n square approaches along the curve L to another adjacent vertex M' of the inner positive n square (M can be either to the left of M' or to the right of M'), The length of the chord $|M^{'}M|$ and the arc $|\overline{M^{'}M}|$ between any two adjacent points M and M' become smaller and smaller. The smaller Angle formed by the intersection of the two adjacent vertices on the curve L and the tangents of the two adjacent vertices M and M'on the inner positive n square (tangent Angle 2α) is also getting smaller. Half of the outer Angle of the tangent, the Angle of the tangent Angle α(the outer Angle of the tangent Angle is just twice the Angle of the tangent Angle for a circle, but this is not necessarily the case for other curves), is also getting smaller and smaller. Tangent Angle α as the variation of Δα and arc $\overline{M^{'}M}$ as long S the variation of Δs as the absolute value of the ratio of the also with arc $\overline{M^{'}M}$ ong as change Δs tend to be zero, its limit value $K^{'}=\lim_{\Delta s\to 0}|\frac{\Delta\alpha}{\Delta s}|=\left|\frac{d\alpha}{ds}\right|$ that is smaller and smaller, tending to zero, and eventually reach zero, Finally, the curvature $K^{'}$of the point $M^{'}$ with respect to the point M becomes zero.

Ince M and M'are any adjacent two points on a closed manifold L, without losing generality, if all adjacent two points on a closed manifold L have exactly the same properties as any adjacent two points M and M', then the curvature K of any point on all adjacent two points on a closed manifold L is zero with respect to the other point, Then all points on a closed manifold L have zero curvature K with respect to their neighbors. And since both M and M'are located on the inner circle where the positive N-square is located, and since M and M' are any adjacent two points on the closed manifold L, without loss of generality, if all adjacent two points on the closed manifold L have exactly the same properties as any adjacent two points M and M', then all adjacent two points on the closed manifold L are located on the inner circle where the positive infinite N-square is located, Moreover, all points on the closed manifold L are located on the inner circle of the positive infinite n square.

Then on the inner circle of the positive infinite n square, the curvature of any point with respect to its neighbors is zero. At the same time, if all closed manifoles have the property of a closed manifold L, then all points on such closed manifoles are located on the inner circle of the positive infinite n square, their curvature with respect to their neighbors is zero, and all such closed manifoles are circles. The necessary and sufficient condition for the poser conjecture to hold is that all closed manifolds can be transformed topologically into closed manifolds with zero curvatures, that is, into circles, and that the geometry formed by such closed manifolds must be a sphere.A circle is essentially a special type of positive n(n traverses all non-negative integers) square. When n is a positive integer of finite size, no matter how small the length of each side of the positive n square is, it is greater than zero, and when n is infinite, taking all non-negative integers, then each side is as small as zero, and the positive n square becomes a circle. My method uses the concept of curvature proposed by Gauss in Euclidean differential topological geometry, and the method of dividing any Angle into three equal parts by an ungraduated ruler and a compass, proving Gauss's conjecture that the curvature of a circle in Euclidean differential topological geometry is zero. Then a closed positive n square, when n is a positive integer and tends to infinity, is a circle, and the curvature of every point on it with respect to its nearest neighbor is zero, and the curvature of every point on the circle of the Gaussian conjecture is zero.

So this closed square with positive n(n traverses all non-negative integers) is a circle. Since all points on the circumference of the circle can be condensed into a single point in the same direction, in line with the premise of the Poincare conjecture, the three-dimensional geometry formed by all such closed manifold must be a ball, in line with the conclusion of the Poincare conjecture, which holds in Euclidean three-dimensional Spaces and two-dimensional surfaces.

Since any adjacent two points M and M' of any closed manifold L are any adjacent vertices of a positive infinite N-square, if their curvature is zero, then they are all on the inner circle where the positive infinite N-square is located. When n is infinite, all the vertices of the

positive infinite n square
are on the inner circle in which they are located, and if all the vertices have zero curvature with respect to their neighbors, the positive infinite n square will coincide with the inner circle in which it is located, and the positive infinite n square will become a circle, so it is impossible for the area of a circle to be the area of a positive finite square, The square of the circle conjecture of the ancient Greek three cubits is not valid.

The square of the circle in the conjecture of the three great geometric ruler in ancient Greece should mean the square of the circle. Since we already know that a circle is a special positive infinite n(n is a non-negative integer approaching infinity) square, it cannot be a positive finite square, so it cannot be a positive square. If "square the circle" in the drawing conjecture of the three great geometric ruler in ancient Greece means to draw with a straight ruler and a compass, and to convert the area of a circle to the area of a square, it will be impossible to achieve. Gauss was right that points on a circle do have zero curvature with respect to their neighbors. Therefore, all points on such a closed manifold can be condensed into one point in the same direction, which conforms to the premise of Poincare's conjecture, and all points on such a closed manifold have zero curvature with respect to their neighbors, so they are a compact closed manifold, and they are all circles.

In the assumption of the Poincare conjecture that "all closed manifold condense to a point in the same direction", if the manifold is compact, it is a circle, which is equivalent to the fact that the curvature of any point on the manifold with respect to the nearest neighboring point is zero. A closed manifold whose curvature is a non-zero constant is definitely not a circle, and any point on it is not compact, although it can be condensed to a point in the same direction, and the absolute value of the curvature of any point on the closed manifold with respect to the nearest neighboring point is a constant greater than zero. A circle is essentially a special positive n square (n traverses all non-negative integers). When n is an infinite positive integer, if the closed manifold must not be a compact manifold, then the length of each side of a square with positive n(n is an arbitrarily finite non-negative integer) and the length of its corresponding arc are greater than zero. When n is infinite, and n takes all non-negative integers, then the length of each of its sides and the length of the arc corresponding to each of its sides will be reduced to zero, and then the positive n(n takes all non-negative integers) square will be a circle. The curvature of each point on the circle is equal to zero with respect to the nearest neighboring point, which conforms to Gauss's conjecture that the curvature of every point on the circle is zero. Since all points on the circumference of a circle can be condensed into a single point in the same direction, and the circle is a compact closed manifold, conforming to the premise of Poincare's conjecture, a three-dimensional geometry consisting of all such compact closed manifold whose curvature is zero at each point must be a sphere. It is consistent with the conclusion of the Poincare conjecture, so the Poincare conjecture is valid in Euclidean
three-dimensional space and two-dimensional surfaceA closed manifold of multiple dimensions (three dimensions and above) with zero curvature in any high dimensional closed space (four dimensions and above) must be a cascade of rings with a coevent common point between every two rings. Such a ring must satisfy the Poincare conjecture of multidimensional surfaces (three and more dimensions) in high-dimensional space (four and

more dimensions). In turn, A closed manifold of high dimensions (four and above) satisfying the Pengcare conjecture of a multidimensional surface (three and above dimensions) must be a cascade of rings with a coevent common point between every two closed rings of a multidimensional surface (three and above dimensions) whose curvature is zero in any high-dimensional space (four and above dimensions). I have proved the Poincare conjecture for two-dimensional surfaces in three-dimensional closed Spaces, and its proof method and conclusion can be extended to any high dimensional (four or more dimensional) closed Spaces and multidimensional surfaces. It is a pure mathematical method that does not depend on physical mathematical methods.

Suppose the area of the circle is S, the circumference of the circle is C, the diameter of the circle is d, the radius of the circle is R, and $C^{'}$ is the circumference of the positive n-sided shape,r is the distance between the center of the positive n-boundary and any of its vertices D_i (i traverses all the full numbers), $|D_iD_{i-1}|$ is the distance between any two adjacent vertices D_i and D_{i-1} of a regular polygon, $\pi=\frac{C}{d}=\frac{C}{2r}$,

$\lambda=\max(|D_2D_1|, |D_3D_2|, |D_4D_3|, \ldots, |D_iD_{i-1}|)$.

Then the area of the i-th isosceles triangle shape in orthomorphosis is:

$$S_i=2*\frac{1}{2}*\frac{1}{2}*|D_iD_{i-1}|*H=\frac{1}{2}*\frac{C^{'}}{n}*H=\frac{C^{'}}{2n}*\sqrt{r^2-\frac{C^{'2}}{4n^2}},$$

Suppose the area of a positive infinite polygon is $S^{'}$, $\lambda\to 0$ as $n\to\infty$, and $C^{'}\to C$,
Then

$$S^{'}=\lim_{\lambda\to 0, C^{'}\to c}\sum_{i=1}^{\infty}s_i=\lim_{\lambda\to 0, C^{'}\to C}\sum_{i=1}^{\infty}S_i=\lim_{\lambda\to 0, C^{'}\to C}\sum_{i=1}^{\infty}\frac{C^{'}}{2n}*\sqrt{r^2-\frac{C^{'2}}{4n^2}},$$

because $\lim_{\lambda\to 0, C^{'}\to C}\frac{C^{'}}{2n}*\sqrt{r^2-\frac{C^{'2}}{4n^2}}=S$, then $S^{'}=S$.

So the area of a positive infinite polygon is the area of the outer circle of its positive infinite n(n traverses all non-negative integers) edge shape.

Therefore, the area of the positive infinite n(n traversing all non-negative integers) is $S^{'}=\pi r^2$, that is to say, the circle can only be transformed into the positive infinite n(n traversing all non-negative integers) edge shape, can not be transformed into a positive finite polygon such as a regular quadrilateral, the area of the circle is impossible to be the area of the positive square.

The sum of a class of power series

We call series of numbers such as "1^k, 2^k, 3^k, …, n^k (n and k are natural numbers) " power series, as"1, 2, 3, …, n","$\mathbf{1^2}$, $\mathbf{2^2}$, $\mathbf{3^2}$, …, $\mathbf{n^2}$","$\mathbf{1^3}$, $\mathbf{2^3}$, $\mathbf{3^3}$, …, $\mathbf{n^3}$","$\mathbf{1^4}$, $\mathbf{2^4}$, $\mathbf{3^4}$, …, $\mathbf{n^4}$", the following formulas are proved to be correct by mathematical induction:

$$1+2+3+4+\ldots+n=\frac{n(n+1)}{2}=\frac{n^2+n}{2},$$

$$\sum\left(\frac{n^2}{2}+\frac{n}{2}\right)=\frac{1^2+2^2+3^2+\ldots+n^2}{2}+\frac{1+2+3+4+\ldots+n}{2}=\frac{1^2+2^2+3^2+\ldots+n^2}{2}+\frac{n(n+1)}{4},$$

$1^2+2^2+3^2+\ldots+n^2=\frac{n(n+1)(2n+1)}{6}=\frac{2n^3+2n^2+n}{6}$,

$1^3+2^3+3^3+\ldots+n^3=[\frac{n(n+1)}{2}]^2=\frac{n^4+3n^2+n^2}{4}$,

$1^4+2^4+3^4+\ldots+n^4=\frac{6n^5+15n^4+10n^3+3n^2-n}{30}$,

$1^5+2^5+3^5+\ldots+n^5=\frac{2n^6+6n^5+5n^4-n^2}{12}$,

$1^6+2^6+3^6+\ldots+n^6=\frac{6n^7+21n^6+21n^5-7n^3+n}{42}$,

$1^7+2^7+3^3+\ldots+n^7=\frac{3n^8+12n^7+14n^6+7n^4+2n^2}{24}$,

$1^8+2^8+3^8+\ldots+n^8=\frac{10n^9+45n^8+60n^7-42n^5+20n^3-3n}{90}$,

$1^9+2^9+3^9+\ldots+n^9=\frac{2n^{10}+10n^9+15n^8-14n^6+10n^4-3n^2}{20}$,

$1^{10}+2^{10}+3^{10}+\ldots+n^{10}=\frac{6n^{11}+33n^{10}+55n^9-66n^7+66n^5-33n^3+5n}{66}$,

We call these formulas the first n terms and formulas of the power series, and the following introduces a derivation method with the 4th power list as an example.

Let's start with an expansion:

$n(n+1)(n+2)(n+3)=n^4+6n^3+11n^2+6n$，From this expansion we can get:

$n^4=n(n+1)(n+2)(n+3)-6n^3-11n^2-6n$,

Take n=1 and we multiply with the * sign, then:

$1^4=1*2*3*4-6-11-6$，

If n=2, then:

$2^4=2*3*4*5-6*2^3-11*2^2-6*2$，

If n=3, then:

$3^4=3*4*5*6-6*3^3-11*3^2-6*3$,

…

$n^4=n(n+1)(n+2)(n+3)-6n^3-11n^2-6n$。

The two sides of these equations are added together, and the * sign indicates multiplication:

$1^4+2^4+3^4+\ldots+n^4=[1*2*3*4+2*3*4*5+3*4*5*6+\ldots+n(n+1)(n+2)(n+3)]-6*[1^3+2^3+3^3+\ldots+n^3]-11*[1^2+2^2+3^2+\ldots+n^2]-6*[1+2+3+4+\ldots+n]$。

To calculate the value of 1*2*3*4+2*3*4*5+3*4*5*6+…+ n(n+1)(n+2)(n+3) in parentheses, suppose n=100, to compute the value of 1*2*3*4+2*3*4*5+3*4*5*6+…+ 100*101*102*103, obviously if it's hard to compute directly, Its value consists of 300 multiplications plus 100 summations,we might as well put 1*2*3*4+2*3*4*5+3*4*5*6+…+100*101*102*103 multiply the terms of by 5, and you get 1*2*3*4*5+2*3*4*5*5+3*4*5*6*5+…+ 100*101*102*103*5, so add the first two terms together and

you get 2*3*4*5*6, then add the third term 3*4*5*6*5 and you get 3*4*5*6*7, then add the fourth term 4*5*6*7*5， and you get 4*5*6*7*8, then add the fifth term5*6*7*8*5， and you get 5*6*7*8*9， ... and so on, the second-to-last term is 99*100*101*102*5, add to the second-to-last term 99*100*101*102*5, and the sum after that is 99*100*101*102*(5+98),that's 99*100*101*102*103,add the last item 100*101*102*103*5 to get 100*101*102*103*(5+99), which is 100*101*102*103*104,

so 1*2*3*4+2*3*4*5+3*4*5*6+…+ 100*101*102*103=$\frac{1}{5}$(100*101*102*103*104),

guess:1*2*3*4+2*3*4*5+3*4*5*6+…+100*101*102*103+...+n*(n+1)(n+2)*(n+3)=$\frac{1}{5}$n*(n+1)(n+2)*(n+3)*(n+4), then$1^4+2^4+3^4+\ldots+n^4$=[1*2*3*4+2*3*4*5+3*4*5*6+…+ n(n+1)(n+2)(n+3)] -6*[$1^3+2^3+3^3+\ldots+n^3$]-11*[$1^2+2^2+3^2+\ldots+n^2$]-6*[1+2+3+4+…+n],

so $1^4+2^4+3^4+\ldots+n^4=\frac{6n^5+15n^4+10n^3-n}{30}$.

The correctness of this formula can be proved by mathematical induction as follows:
If n=1, then (6+15+10-1)/30=1, the formula is obviously true, and the formula is also true if n=k, then

$1^4+2^4+3^4+\ldots+k^4=\frac{6k^5+15k^4+10k^3-k}{30}$,then

when n=k+1,

$1^4+2^4+3^4+\ldots+k^4+(k+1)^4=\frac{6k^5+15k^4+10k^3-k}{30}+(k+1)^4=\frac{6k^5+15k^4+120k^3+15k^2+119k+30}{30}$, and

$\frac{6(k+1)^5+15(k+1)^4+10(k+1)^3-(k+1)}{30}=\frac{6k^5+15k^4+120k^3+15k^2+119k+30}{30}$,

so $\frac{6k^5+15k^4+10k^3-k}{30}+(k+1)^4=\frac{6(k+1)^5+15(k+1)^4+10(k+1)^3-(k+1)}{30}$.

This proves that the formula also works when n=k+1. Through the above proof we can know

n take any natural number, the formula $1^4+2^4+3^4+\ldots+n^4=\frac{6n^5+15n^4+10n^3-n}{30}$ is true.

The unification of gravity and quantum mechanics

Newton's universal gravitation and the unification of quantum mechanics, please refer to the content I published in the journal of the American academy of multidisciplinary research and development(AJMRD)paper"A new space-time theory"
(please visit: https://www.ajmrd.com/vol-6-issue-5/;
Or https://www.ajmrd.com/wp-content/uploads/2024/05/D643745.pdf) associated with the quantum mechanics theory.The Newtonian gravitation between an object A and an object B is F, then their force F, using the relevant theory of quantum mechanics, can be expressed in terms of the mass of the object m, combined with other physical quantities:$F = G\frac{Mm}{r^2} = |-\frac{mC^2}{r}| = |-\frac{mhC\times C}{h\times r}| \approx \frac{1.24eV\times \mu m\times m\times C}{hr} = \frac{1.24\times 10^{-6}eV\times m\times C}{hr}$. In the above formula:The ‘x’ symbol means multiplication,
M is the mass of the object A in kilograms,

m is the mass of the object B in kilograms.
r is the average distance of the force between the object A and the object B, in meters,
h is Planck's constant, h=6.62606957(29)×10^{-34}J.s,
hc≈1.24meVmm=1.24eV. μm = 1.24× 10^{-6}eV. m,
1eV=1 electron volt,
1μm=1micron=10^{-6}m,
G is Newton's universal gravitation constant, G=(6.67 ∓ 0.07)×$10^{-11}$$m^3$/($kg^{-1}$·$s^{-2}$),
C is the propagation rate of light in vacuum, C≈2.997924583×10^8m/s.

Several other questions

A similar method can be used to derive the summation formula of 5 to 10 power series and the summation formula of 11 to 11 power series, and can also be proved by referring to the above method.
So the area of a positive infinite polygon is the area of the outer circle of its positive infinite n(n traverses all non-negative integers) edge shape.
Therefore, the area of the positive infinite n(n traversing all non-negative integers) is $S' = \pi r^2$, that is to say, the circle can only be transformed into the positive infinite n(n traversing all non-negative integers) edge shape, can not be transformed into a positive finite polygon such as a regular quadrilateral, the area of the circle is impossible to be the area of the positive square.
Does disjoint mean parallel? How to unify Euclidean geometry, Lobachevsky geometry and Riemannian geometry?Disjoint may not parallel, disjoint can be parallel or not parallel,not parallel does not necessarily intersect; Intersect can have points of intersection or it can have no points of intersection； Parallelism can have points of intersection (such as overlap) or it can have no points of intersection. In order to unify Euclidean geometry, Lobachev geometry, and Riemannian geometry, I rewrote the fifth postulate of geometry. The other four formulas do not change, they are:
Postulate 1: a straight line can be made from any point to any point.
Postulate 2: a finite line can continue to be extended.
Postulate 3: circles can be drawn at any point and at any distance.
Postulate 4: All right angles are equal.
Postulate 5: Beyond a known line, it may not be possible to make any line parallel to a known line, if a line can be made parallel to a known line, then at least one line can be made parallel to a known line, and even any number of lines can be made parallel to a known line. On the other hand, if you go beyond a line, you may not be able to make any line intersect a known line, and if you can make a line intersect a known line, you can make at least one line intersect a known line, and you can even make any number of lines intersect a known line.
Newton's universal gravitation and the unification of quantum mechanics, please refer to the content I published in the journal of the American academy of multidisciplinary research and development(AJMRD)paper"A new space-time theory"
(please visit: https://www.ajmrd.com/vol-6-issue-5/;
Or https://www.ajmrd.com/wp-content/uploads/2024/05/D643745.pdf) associated with the quantum mechanics theory.The Newtonian gravitation between an object A and an object B is F, then their force F, using the relevant theory of quantum mechanics, can be expressed in terms of

the mass of the object m, combined with other physical quantities: $F = G\frac{Mm}{r^2}$ =|- $\frac{mC^2}{r}$ $| = | -$ $\frac{mhC\times C}{h\times r}$ $| \approx \frac{1.24eV\times\mu m\times m\times C}{hr} = \frac{1.24\times10^{-6}eV\times m\times C}{hr}$. In the above formula:The 'x' symbol means multiplication,

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r is the average distance of the force between the object A and the object B, in meters,

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hc≈1.24meVmm=1.24eV. $\mu m = 1.24\times 10^{-6}$eV. m,

1eV=1 electron volt,

1μm=1micron=10^{-6}m,

G is Newton's universal gravitation constant, G=(6.67 ∓ 0.07)$\times10^{-11}m^3/(kg^{-1}\cdot s^{-2})$,

C is the propagation rate of light in vacuum, C≈2.997924583$\times10^8$m/s.

A new working principle of controlled nuclear fusion ——my idea on the working principle of controlled nuclear fusion : Inertial magnetic confinement of deuterium and tritium will gather them into a specific region (small fusion ring), and use the laser beam generated by battery discharge to continuously irradiate this specific region (small fusion ring), generating hundreds of millions of degrees of high temperature, so that the deuterium and tritium in this specific region produce fusion, generating a large number of high temperature heat. And these high temperature heat into another large specific area (big fusion ring) through helium, when starting the nuclear reactor, the controlled nuclear polymerization device small fusion ring work first (preheat), a steady stream of high temperature heat generated in the small fusion ring into the big fusion ring, the heat is constantly imported and enriched into the big fusion ring. So that the temperature in the big fusion ring also reaches hundreds of millions of degrees, so that the inertial magnetic confinement of deuterium and tritium in the big fusion ring produces nuclear fusion, and the heat is continuously generated and enriched in the big fusion ring, maintaining the temperature of hundreds of millions of degrees, so that the nuclear fusion reaction of deuterium and tritium in the big fusion ring can continue. When the energy produced by the nuclear fusion reaction of deuterium and tritium confined by inertial magnetic confinement in the big fusion ring begins to gain, and the gain reaches a sufficient proportion, a part of the gained energy is exported to drive a steam turbine or gas turbine to generate electricity. Part of the electricity emitted charges the battery, so that the laser fusion reaction in the small fusion ring can continue, and the amount of battery discharge is reasonably distributed, and the remaining part of the electricity is output to the external grid through the transmission line.

The Proof of the Collatz conjecture:

The Collatz conjecture was proposed by German mathematician Lothar Collatz in 1937 and is also known as the "3n+1" conjecture or the "Kakutani conjecture".

The Collatz conjecture is defined by a simple iterative process:Start with any positive integer: If it is even, divide it by 2, if it is odd, multiply it by 3 and add 1;

Repeat the above steps.

The conjecture claims that for any positive integer, repeating this process will eventually lead to 1.

Example:
For example, start with 6:6 → 3 → 10 → 5 → 16 → 8 → 4 → 2 → 1
From 19:
19 → 58 → 29 → 88 → 44 → 22 → 11 → 34 → 17 → 52 → 26 → 13 → 40 → 20 → 10 → 5 → 16 → 8 → 2 → 1
By computer verification, Collatz's conjecture holds for numbers less than 10^{18}, but for a long time no one could give a general proof, and Collatz's conjecture was long an open problem. Now that I've found a general proof, Collatz's conjecture works. Let me show you how I proved it.
Proof: For any non-negative integer p and for any non-negative integer q, suppose N=2p+3q=2(p+q)+q. Non-negative integers include all even numbers and all odd numbers. If p is any non-negative integer and q is any even number, then N=2p+3q=2(p+q)+q must be any even number. If p is any nonnegative integer and q is any odd number, then N=2p+3q=2(p+q)+q must be any odd number. So if p is any non-negative integer and q is a non-negative integer, then N=2p+3q=2(p+q)+q must be any non-negative integer. Now consider assuming that
N=2p+3q+1=2(p+q)+q+1(p is any non-negative integer and q is any non-negative integer), then N=2p+3q+1=2(p+q)+q+1(p is any non-negative integer and when is any non-negative integer) is any positive integer.
According to Collatz rules, start with any positive integer and divide it by 2 if it is even, multiply it by 3 and add 1 if it is odd. Repeat the above steps. If we divide the above process into several steps, in each step, starting with any positive integer, if it is even, then divide it by 2, if it is odd, then multiply it by 3 plus 1, and add up the results obtained by dividing by 2 or 3 plus 1 in all steps, then the result N satisfies:

$$N = \lim_{n\to+\infty}\left(\sum_{i=1}^{n}(2^{u_i}v_i + 3v_i + 1)\right)(\text{i is A positive integer, } u^i \text{ is any non} - \text{negative integer, } u^i \geq 0, v_i \text{ is any odd number, } v_i \geq 1 \text{ , n is a positive integer}).$$

Now let me explain the whole process. Starting with any positive integer, if it is even and it can be written in the expression 2^{u_i} (i is a positive integer, 2^{u_i} is any non-negative integer , $u^i \geq 0$), If you divide 2^{u_i} by 2 continuously, the result is of course 1. If it is even and it cannot be written as 2^{u_i} (i is a positive integer and u^i is any non-negative integer , $u^i \geq 0$), then it must be written as the expression of
$2^{u_i}\times v_i$(i is a positive integer, u^i is any non − negative integer, $u^i \geq 0, v_i$ is any odd number, $v_i \geq 1 \geq 1$, n is a positive integer," × " indicates multiplication) ,indicating that it is divided by 2 after u^i times, gives the odd number v_i. After getting the odd number v_i, the rule is that v_i should be multiplied by 3 and added by 1 to get $3v_i+1$.
When v_i is any odd number, then $3v_i+1$ must be even. Since $3v_i + 1 = 4v_i - v_i + 1$, which is every even number, divide it by 4 to get $v_i - \frac{v_{i-1}}{4}$. When $v_i > 1$, then $v_i - 1 > 0$, so when $v_i > 1$, then $v_i - \frac{v_{i-1}}{4} < v_i$. At most When $v_i \geq 5$, the value of v_i in $3v_i + 1$ must be reduced and become smaller, according to the rules set by Collatz.

Since 3×5+1=16→8→4→2→1, and 3×3+1=10→5→3×5+1=16→8→4→2→1, when $v_i > 1$, the value of v_i in $3v_i + 1$ must be reduced and become smaller according to the rules set by Collatz.

First $3v_i + 1$divided by 2, $3v_i + 1$ becomes $2w_j$(j is a positive integer and w_j is a positive integer), then v_i becomes w_j(j is a positive integer and $w_j$is a positive integer, then if w_j is an even number, then divide w_j by 2 to get w_{j+1}, as v_i becomes w_{j+1}(j is a positive integer and $w_{j+1}$is a positive integer). If w_{j+1} is an even number, then divide w_{j+1} by 2 to get w_{j+2} , then think of it as v_i becomes w_{j+2}, and if w_{j+2} is still an even number, then let w_{j+2}continue to divide by 2. Until we know that we have an odd number, we assume that the odd number is w_{j+k}(j is a positive integer, k is a positive integer, and $w_{j+k}$is a positive integer), and then we think of v_i as w_{j+k}(j is a positive integer, k is a positive integer). If $w_j$is odd, then multiply w_j by 3 and add 1, and you get $3w_j$+1, which is taken as v_i becomes w_j(j is a positive integer and w_j is a positive integer), because when w_j is odd, then $3w_j$+1 must be even. Then divide $3w_j$+1 by 2 to get w_{j+2}. If w_{j+2} is even, divide w_{j+2} by 2 to get w_{j+3}. If w_{j+3} is still even, so on. Then let w_{j+3} continue to divide by 2 until you get an odd number, assuming that the odd number is w_{j+k}(j is a positive integer, k is a positive integer, and w_{j+k} is a positive integer), and think of it as v_i becomes w_{j+k}(j is a positive integer, k is a positive integer). According to the previous calculations,

If v_i>1, then there must be $v_i > w_{j+k}$ (j is a positive integer and k is a positive integer). Since v_i is odd, v_i>1 is equivalent to v_i≥3. According to the rules set by Collatz, when v_i=3, start with some positive integer $3v_i$+1=10, which is even, divide it by 2 to get 5, and then, 3 x 5+1=16. 16→8→4→2→1, such as the final value of v_i will be able to fall, become small, become 1.

When $v_i > 3$, start with some positive integer $3v_i$+1, divide it by 2 if it is even, multiply it by 3 and add 1 if it is odd, and eventually the value of v_i can also come down, become smaller, and become 1. For odd numbers greater than or equal to 3, the resulting value of their reduction must be 1. When v_i=1, then $3v_i$+1= 4, 4 divided by 2, you get 2, 2 divided by 2, you get 1. So, according to the rules set by Collatz, when v_i≥1(i is a positive integer, v_i is odd, × means multiplication), start with some positive integer $3v_i$+1, divide it by 2 if it is even, multiply it by 3 and add 1 if it is odd, Eventually the value of v_i must come down and become smaller until it becomes 1. Finally, the value of $3v_i$+1 becomes 4, 4 divided by 2, gets 2, 2 divided by 2, gets 1.Even though

$N = \lim_{n\to+\infty} \left(\sum_{i=1}^{n} (2^{u_i}v_i + 3v_i + 1)\right)$(i is A positive integer, u^i is any non − negative integer, $u^i \geq 0$, v_i is any odd number, $v_i \geq 1$, n is a positive integer) is an odd number, think of it as v_i,and according to the rules set by Collatz, when v_i≥1(i is a positive integer, v_i is odd, the value of $3v_i$+1 is an odd number, × means multiplication), starting with some positive integer $3v_i$+1, if it is even, then divide it by 2, if it is odd, then multiply it by 3 and add 1, and eventually the value of v_i will be able to fall, become smaller, until it becomes 1. Finally, the value of $3v_i$+1 becomes 4. 4 divided by 2 gives you 2. 2 divided by 2 gives you 1. According to the proof in front of,

$$N = \lim_{n\to+\infty}\left(\sum_{i=1}^{n}(2^{u_i}v_i + 3v_i + 1)\right)$$

can represent all positive integers, so it can also represent all odd numbers. Even $v_i = N = \lim_{n\to+\infty}\left(\sum_{i=1}^{n}(2^{u_i}v_i + 3v_i + 1)\right)$, think of it as v_i, then in accordance with the rules

of Collatz's, when $v_i \geq 1$ (i is a positive integer, v_i is odd), Starting with some positive integer $3v_i+1$, if it is even, divide it by 2, if it is odd, multiply it by 3 and add 1, and eventually the value of v_i must come down and become smaller until it becomes 1. Finally, the value of $3v_i+1$ becomes 4. 4 divided by 2 gives you 2. 2 divided by 2 gives you 1. According to the previous proof,

From $3 \times \lim_{n\to+\infty}\left(\sum_{i=1}^{n}(2^{u_i}v_i + 3v_i + 1)\right)$(i is A positive integer, u^i is any non − negative integer, $u^i \geq 0$, v_i is any odd number, $v_i \geq 1$, n is a positive integer)start, if it is even, divide it by 2, if it is odd, multiply it by 3 and add 1, eventually the value of v_i must be reduced, smaller, Until it becomes 1. Finally, the value of $3v_i+1$ becomes 4, 4 divided by 2, gets 2, 2 divided by 2, gets 1. If

$3\lim_{n\to+\infty}\left(\sum_{i=1}^{n}(2^{u_i}v_i + 3v_i + 1)\right)$(i is a positive integer, u^i is any non − negative integer, $u^i \geq 0$, v_i is any odd number, $v_i \geq 1$, n is a positive integer) is an even value, so let it be divided by 2 several times until you get an odd number w_{j+k}(j is a positive integer, k is a positive integer, w_{j+k} is a positive integer) until then w_{j+k} is assigned to v_i, according to the above method, according to the rules set by Collatz, then when $v_i \geq 1$(i is a positive integer, v_i is odd, × means multiplication), start with some positive integer $3v_i+1$, if it is even, divide it by 2, if it is odd, Multiply it by 3 and add 1, and eventually the value of v_i will drop and become smaller until it becomes 1. Finally, the value of $3v_i+1$ becomes 4. 4 divided by 2 gives you 2. 2 divided by 2 gives you 1. So starting with any positive integer, according to the rules set by Collatz, if it is even, divide it by 2, if it is odd, assign it to v_i(i is a positive integer, v_i is odd) and multiply it by 3 plus 1, then when $v_i \geq 1$(i is a positive integer, v_i is odd, × means multiplication), and eventually the value of v_i will drop and become smaller until it becomes 1. Finally, the value of $3v_i+1$ becomes 4, 4 divided by 2, gets 2, 2 divided by 2, gets 1. So Collatz's conjecture must be true.

III. Conclusion

After Ferma's Last theorem conjecture and Mersenne's prime conjecture are proved to be fully valid, the study of the distribution of prime numbers and other related other studies will play a driving role. Readers can do a lot in this regard.

IV.Thanks

Thank you for reading this paper.

V.Author

The sole author, poses the research question, demonstrates and proves the question.

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