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The Concise Proof Method of the Ferma Conjecture Under the Prime Number Convention

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Abstract

The 16th century French amateur mathematician Fermat declared that he had proved himself but could not prove the proof process in the book, which later became Fermat's Great Theorem. For more than three hundred years, the proof of Ferma's theorem has attracted a large number of mathematicians, and also produced a lot of unintentional results. In 1995, the British mathematician Wiles used a variety of complex modern mathematical methods to prove Ferma's theorem, which became a legend in the history of mathematics. However, people still expect to find the concise proof method claimed by Ferma. This paper proposes a concise proof method of Ferma's great theorem. This method can realize the concise proof of Ferma's great theorem under the condition of prime number convention.

Keywords: Fermat's Great Theorem, Concise Proof, Symmetry Exchange Method, Antithesis Method

1. Foreword

The French man Fermat is a legend in the history of science, He was a lawyer by profession, But he is well known for his mathematical studies, In 1637, When he was reading the Latin translation of the ancient Greek mathematician Diophantine's book arithmetic, Next to volume 11, proposition 8: " Break a cubic number into the sum of two cubic numbers, Or decompose a fourth power into the sum of two fourth exponents; Or the general decomposition of a power higher than a quadratic into the sum of two equal exponents, This is not possible, About this, I am certain that a wonderful method of proof has been discovered, Unfortunately, the blank space here is too small, Can't write it"

Ferma means that for $x^n + y^n = z^n$ When $n > 2$ no positive integer solution, this is the famous fermat guess, in 1667, his son of the books to this paragraph and published, from then on, fermat guess attracted countless mathematics lovers, however, since 1667 to the 1990s, no mathematician successfully proved the guess, including famous mathematicians such as euler and gauss, so that the conjecture has been rated as the most difficult mathematical problems.

Evidence of fermat theorem stimulated the development of analytic number theory in the nineteenth century and the twentieth century modular form theorem, during which appeared many proofs for specific n value, fermat himself proved the case of $n = 4$ in the equation without integer solution, but until the 1990s, has not been able to get the complete proof of fermat conjecture.

In 1995, the British mathematician Wiles used a variety of complex modern mathematical methods to prove Fermat's great theorem, which became a legend in mathematical history. But one still expects to find the concise method of proof that Fermat claims.

2. Main Body

In this paper, we propose a concise proof of ferma theorem under the prime convention, which adopts the combination of symmetry exchange method and the concise proof of ferma theorem under the prime convention. This paper plans, proving that the equation $x^n + y^n = z^n$, When n is an odd number greater than equal to 3 and when z is 3, there is no integer solution, because the equation is an even number equal to 6, the equation can be converted into the corresponding equation with an odd power, because Ferma himself has proved that the equation has no integer solution for $n = 4$, as long as the equation x can be proved$^n + y^n = z^n$, When n is an odd number greater than or equal to 3, the equation has no integer solution, we can fully prove that ferma's great theorem holds if the integer is the power of the integer and the integer is greater than or equal to 3

The specific certification process is as follows:

First take n = 3 as an example for the equation xn+yn=zn, z is a prime number greater than or equal to 3, then x, y must be one odd and one even, first assume a positive integer solution when n=3, because obviously x cannot be equal to y, x + y> z, here first assume x> y, on both sides of the equation simultaneously multiplied by 23, Then obtain equation 2: $(2x)^3 + (2y)^3 = (2z)^3$,

Next, the symmetry element replacement method is adopted, making 2x = a + b, 2y = a-b, c = z, and substituting equation 2 to obtain equation 3 as follows:

$(2a)*(a^2 + 3b^2)=(2c)^3$,

According to equations 2 and 3 and the preset conditions, we can conclude that equations 2 and 3 have positive integer solutions as follows:

Condition 1: because 2x = a + b, 2y = a-b, a = x + y, b = x - y, because the previous preset x, y is odd and even, and x> y, then a must be odd, and a> c;

Condition 2: According to equation 3 and before, 3= <c <a <2c

Since c is a prime number, according to the permutation combination, $(2c)^3$ There are only several product factors listed below, which are listed below

2	2^2	2^3
c	$1c^2$	c^3
2c	$2c^2$	$2c^3$
2^2c	2^2c^2	2^2c3
2^3c	2^3c2	2^3c^3

Table 1: From equation 3, 2a must be used $(2c)^3$ The product factor,

When 2a=2 can introduce a=1, the condition of a> 3 in condition 2 is violated

When $2a=2^2$Can launch a=2, violating the condition that a in condition 1 is odd

When $2a=2^3$Can launch a=4, violating the condition that a in condition 1 is odd

When 2a=c, violate the condition in condition 1 where both a and c are odd

When $2a= c^2$, in violation of condition 1 where both a and c are odd

When $2a= c^3$, in violation of condition 1 where both a and c are odd

When 2a=2c can launch a=c, violate the condition of a> c in condition 1

When 2a=2 c2Can launch $a= c^2$, since c>, violating the condition a <2c in condition 2 =3

When 2a=2 c3Can launch $a= c^3$, since c>, violating the condition a <2c in condition 2 =3

When 2a=4c can derive a=2c, the condition of a <2c in condition 2 and the parity of a are violated

When $2a=4 c^2$ Can launch $a=2 c^2$, Against condition and a <2c in condition 2 because c> =3

When $2a=4 c^3$ Can launch $a= 2c^3$, Against condition and a <2c in condition 2 because c> =3

When 2a=8c can derive a=4c, the condition of a <2c in condition 2 and the parity of a are violated

When $2a=8 c^2$ Can launch $a=4 c^2$, Against condition and a <2c in condition 2 because c> =3

When $2a=8 c^3$ Can launch $a= 4c^3$, Against condition and a <2c in condition 2 because c> =3

Since inconsistent conclusions can be derived for each product factor, it can be shown that for n=3, z is prime or equal to $3^n+y^n=z^n$ No positive integer solution.

However, we should take n=5 as an example for the equation $x^n + y^n = z^n$, z is a prime number greater than or equal to 3, then x, y must be odd and even, first assume that there is a positive integer solution when n=5, because there still must be x cannot be equal to y, y + y> z, here first assume x> y, on both sides of the equation multiplied by 25, You can get equation 4: $(2x)^5+(2y)^5=(2z)^5$,

Next, the symmetric element replacement method is still adopted, by substituting 2x=a + b, 2y=a-b, c=z into equation 4. Equation 5 is as follows: $(2a) * (a^4+10a^2b^2+5b^4)=(2c)^5$,

According to equations 4 and 5 and the preset conditions, several conditions that equations 4 and 5 have positive integer solutions are as follows:

Condition 3: because 2x=a + b, 2y=a-b, can push + y a, x, b=x-y, because x is preset, y is odd and even, and x> y, then a and b must be odd, and a> c, b> =1;

Condition 4: According to equation 5 and before, 3=<c<a<2c,0.5a <c <a,

Since c is a prime number, according to the permutation combination, $(2c)^5$There are only several product factors listed below, which are listed below

2	2^2	2^3	2^4	2^5
c	$1c^2$	c^3	$1c^4$	$1c^5$
2c	$2c^2$	$2c^3$	$2c^4$	$2c^5$
2^2c	2^2c^2	2^2c^3	2^2c^4	2^2c^5
2^3c	2^3c^2	2^3c^3	2^3c^4	2^3c^5

2^4c	2^4c^2	2^4c^3	2^4c^4	2^4c^5
2^5c	2^5c^2	2^5c^3	2^5c^4	2^5c^5

Table 2: From equation 5, 2a must be used $(2c)^5$ The product factor,

When 2a=2 can introduce a=1, the condition of a> 3 in condition 2 is violated
When $2a=2^2$ Can launch a=2, violating the condition that a in condition 1 is odd
When $2a=2^3$ Can launch a=4, violating the condition that a in condition 1 is odd
When $2a=2^4$ Can derive a=8, violating the condition that a in condition 1 is odd
When $2a=2^5$ Can derive a=16, violating the condition that a in condition 1 is odd

When 2a=c, violate the condition in condition 1 where both a and c are odd
When $2a= c^2$, In violation of condition 1 where both a and c are odd
When $2a= c^3$, In violation of condition 1 where both a and c are odd
When $2a= c^4$, In violation of condition 1 where both a and c are odd
When $2a= c^5$, In violation of condition 1 where both a and c are odd

When 2a = 2c can launch a = c, violate the condition of a> c in condition 1
When $2a = 2c^2$ Can launch $a= c^2$, Since c>, violating the condition a <2c in condition 2 =3
When $2a = 2c^3$ Can launch $a= c^3$, Since c>, violating the condition a <2c in condition 2 =3
When $2a = 2 c^4$ Can launch $a= c^4$, Since c>, violating the condition a <2c in condition 2 =3
When $2a= 2c^5$Can launch $a= c^5$, Since c>, violating the condition a <2c in condition 2 =3

When 2a = 4c can introduce a=2c, the condition of a <2c in condition 2 is violated
When $2a= 4c^2$ Can launch $a= 2c^2$, Against condition and a <2c in condition 2 because c> =3
When $2a= 4c^3$ Can launch $a= 2c^3$, Against condition and a <2c in condition 2 because c> =3
When $2a= 4c^4$ Can launch $a= 2c^4$, Against condition and a <2c in condition 2 because c> =3
When $2a= 4 c^5$ Can launch $a= 2c^5$, Against condition and a <2c in condition 2 because c> =3

When 2a= 8c can derive a= 4c, the condition of a <2c in condition 2 and the parity of a are violated
When $2a= 8 c^2$ Can launch $a= 4c^2$, Against condition and a <2c in condition 2 because c> =3
When $2a= 8c^3$ Can launch $a= 4c^3$, Against condition and a <2c in condition 2 because c> =3
When $2a=8 c^4$ Can launch $a=4 c^4$, Against condition and a <2c in condition 2 because c> =3
When $2a=8 c^5$ Can launch $a= 4c^5$, Against condition and a <2c in condition 2 because c> =3

When 2a=16c can derive a=8c, the condition of a <2c in condition 2 and the parity of a are violated
When $2a=16 c^2$ Can be launched with $a= 8c^2$, Against condition and a <2c in condition 2 because c> =3
When $2a=16 c^3$ Can be launched with $a= 8c^3$, Against condition and a <2c in condition 2 because c> =3
When $2a=16 c^4$ Can be launched with $a= 8c^4$, Against condition and a <2c in condition 2 because c> =3
When $2a=16 c^5$ Can be launched with $a= 8c^5$, Against condition and a <2c in condition 2 because c> =3

When 2a=32c can introduce a=16c, a <2c in condition 2 is violated
When $2a=32 c^2$ Can be launched with $a=16 c^2$, Against condition and a <2c in condition 2 because c> =3
When $2a=32c^3$ Can be launched with $a= 16c^3$, Against condition and a <2c in condition 2 because c> =3
When $2a=32c^4$ Can be launched with $a=16 c^4$, Against condition and a <2c in condition 2 because c> =3
When $2a=32c^5$ Can be launched with $a= 16c^5$, Against condition and a <2c in condition 2 because c> =3

Since inconsistent conclusions can be derived for each product factor, it can be shown that equation x for n=5 and z is a prime more than or equal to $3^n+y^n=z^n$ No positive integer solution.

Using the above method, we can sequentially prove that, for the equation $x^n + y^n = z^n$, when n is an odd number equal to 3 (3,5,7,9....), And when z is a prime number greater than or equal to 3, the contradiction can be introduced, so the equation has no integer solution, and because when n is an even number greater than or equal to 6, the equation can be transformed into the corresponding equation whose power is odd, the proof method and the proof method when n is odd are basically the same. The proof process is as follows:

Next, we take the case of n = 6 as an example
When n=6, and z is more than 3, the equation $x^n + y^n = z^n$ No positive integer solution.

For equation $x^6 + y^6 = z^6$, z is a prime number greater than or equal to 3, then x, y must be one odd and one even, first assume that there is a positive integer solution when n=6, because obviously x cannot be equal to y, y + y> z, here first assume x> y, make $u = x^2$, $v = y^2$, $w= z^2$, You can get equation 6: $(u)^3 + (v)^3 = (w)^3$,
According to the preset condition, for equation 6 should satisfy u>

v, u and v should be one odd and one even, and w should be one equal to z^2 The odd number of

For equation 6, both sides are simultaneously multiplied by 23, Then obtain equation 7: $(2u)^3 + (2v)^3 = (2w)^3$,

Next, the symmetry element replacement method is adopted, making 2u = a + b, 2v = a-b, c=w, and substituting equation 2 to obtain equation 8 as follows:

(2a)*(a2+3b2)=(2c)3,

According to equations 6,7 and 8, and preset conditions, we follow that equations 6,7 and 8 have positive integer solutions:

Condition 5: because 2u = a + b, 2v = a -b, a = u + v can be introduced, b=u-v, because u is preset, v is one odd and one even, and u> v, then a must be odd, and a> c;

Condition 6: According to equation 8 and before, 3 = <c <a <2c support c=w=z2In equation 9, equation 9: $(2a) * (a^2+3b^2)=(2\ z^2)^3 = 2^3z^6$,

Since z is a prime number, combined according to the permutation, 2^3z^6 There are only several product factors listed below, which are listed below

2	2^2	2^3			
z	$1z^2$	z^3	$1z^4$	$1z^5$	$1z^6$
2z	$2z^2$	$2z^3$	$2z^4$	$2z^5$	$2z^6$
2^2z	2^2z^2	2^2z^3	2^2z^4	$22z^5$	2^2z^6
2^3z	2^3z^2	2^3z^3	2^3z^4	2^3z^5	2^3z^6

Table 3: From equation 9, we know that 2a must be 2^3z^6 The product factor,

When 2a=2 can introduce a=1, the condition of a> 3 in condition 6 is violated

When $2a=2^2$ Can launch a=2, violating the condition that a in condition 5 is odd

When $2a=2^3$ Can derive a=4, violating the condition that a in condition 5 is odd

When 2a=z, violate the condition where both a and z in condition 5 are odd

When $2a= z^2$, The condition where both a and z in condition 5 are odd

When $2a= z^3$, The condition where both a and z in condition 5 are odd

When $2a= z^4$, The condition where both a and z in condition 5 are odd

When $2a= z^5$, The condition where both a and z in condition 5 are odd

When $2a= z^6$, The condition where both a and z in condition 5 are odd

When 2a = 2z can launch a =z <c, violate the condition a> c in condition 5, condition

When $2a = 2\ z^2$ Can be introduced with $a = z^2 =c$, condition of a> c in condition 5

When $2a = 2\ z^3$ Can be introduced with $a = z3>2\ z^2 = 2c$, violating the condition with a <2c in condition 5

When $2a = 2\ z^4$ Can be introduced with $a = z^4>2\ z^2= 2c$, violating the condition with a <2c in condition 5

When $2a = 2\ z^5$ Can be introduced with $a = z^5>2\ z^2 = 2c$, violating the condition with a <2c in condition 5

When $2a = 2\ z^6$ Can be introduced with $a = z^6>2\ z^2 = 2c$, violating the condition with a <2c in condition 5

When 2a = 4z can derive a = 2z <c, the condition of a> c and the parity of a in condition 5 are violated

When $2a=4\ z^2$ Can be introduced with $a = 2\ z^2 = 2c$, violating the parity of condition a with a <2c in condition 6

When $2a=4\ z^3$ Can be introduced with $a= 2z^3> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When $2a=4\ z^4$ Can be introduced with $a= 2z^4> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When $2a=4\ z^5$ Can be introduced with $a= 2z^5> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When $2a=4\ z^6$ Can be introduced with $a= 2z^6> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When 2a=8z can introduce a=4z, violating the parity of a in condition 5

When $2a=8\ z^2$ Can be introduced with $a=4\ z^2=4c$, and the condition of a <2c in violation condition 6, and the parity of a

When $2a=8\ z^3$ Can be introduced with $a= 4z^3> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When $2a=8\ z^4$ Can be introduced with $a= 4z^4> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When $2a=8\ z^5$ Can be introduced with $a= 4z^5> 2c$, violating the condition of a <2c in condition 6, and the parity of a

When $2a=8\ z^6$ Can be introduced with $a= 4z^6> 2c$, violating the condition of a <2c in condition 6, and the parity of a

Since inconsistent conclusions can be derived for each product factor, it can be shown that for n = 6, z is prime or equal to $3^n + y^n = z^n$ No positive integer solution.

It is next shown with the case at n =10

When n =10 and z is more than 3, equation $x^n + y^n = z^n$ No positive integer solution.

For equation $x^{10} + y^{10} = z^{10}$, z is a prime number greater than or equal to 3, then x, y must be one odd and one even, first assume a positive integer solution when n=10, because obviously x cannot be equal to y, y + y> z, here first assume x > y, make $u = x^2$, $v = y^2$, $w= z^2$, Then obtain equation 10: $(u)^5+(v)^5 = (w)^5$,

According to the preset condition, for equation 10 should satisfy u> v, u and v should be one odd and one even, and w should be one equal to z^2 The odd number of

For equation 6, both sides are simultaneously multiplied by 25, Then obtain equation 11: $(2u)^5 + (2v)^5 = (2w)^5$,

Next, the symmetry element replacement method is adopted, making 2u = a + b, 2v = a-b, c = w, and substituting equation 2 to obtain equation 12 as follows:

$(2a)*(a^4 + 10a^2b^2 + 5b^4) = (2c)^5$,

According to equation 10, equation 11 and equation 12 and preset conditions, several conditions that equation 10,11 and equation 12 have positive integer solutions are as follows:

Condition 7: because 2u=a + b, 2v=a-b, can launch a=u + v, b=u-v, because the previous preset u, v is one odd and one even, and u> v, then a must be odd, and a> c;

Condition 8: According to equation 12 and before, 3= <c <a <2c can be introduced

support c=w=z2Enter Equation 12 to obtain Equation 13: $(2a) * (a^4 +10a^2b^2 + 5b^4) = (2c)^5 = 2^5z^{10}$

Since z is a prime number, combined according to the permutation, 2^5z^{10} There are only several product factors listed below, which are listed below

2	2^2	2^3	2^4	2^5					
z	$1z^2$	z^3	$1z^4$	$1z^5$	$1z^6$	$1z^7$	$1z^8$	$1z^9$	$1z^{10}$
2z	$2z^2$	$2z^3$	$2z^4$	$2z^5$	$2z^6$	$2z^7$	$2z^8$	2z9	2z10
2^2z	2^2z^2	2^2z^3	2^2z^4	2^2z^5	2^2z^6	2^2z^7	2^2z^8	2^2z^9	$2^2 z^{10}$
2^3z	2^3z2	2^3z^3	2^3z^4	2^3z^5	2^3z^6	2^3z^7	2^3z^8	2^3z^9	2^3z^{10}
2^4z	2^4z^2	2^4z^3	2^4z^4	2^4z^5	2^4z^6	2^4z^7	2^4z^8	2^4z^9	2^4z^{10}
2^5z	2^5z^2	2^5z^3	2^5z^4	2^5z^5	2^5z^6	2^5z^7	2^5z^8	2^5z^9	2^5z^{10}

Table 4: From equation 13 shows that 2a must be 2^5z^{10} The product factor,

When 2a=2 can introduce a=1, the condition of a> 3 in condition 8 is violated

When 2a=2^2 Can be able a=2, violating the condition 7 where a is odd

When 2a=2^3 Can be able a=4, violating the condition 7 where a is odd

When 2a=2^4 Can derive a=8, violating the condition that a in condition 7 is odd

When 2a=2^5 Can launch a=16, violating the condition that a in condition 7 is odd

When 2a=z, violate the condition where both a and z in condition 7 are odd

When 2a= z^2, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^3, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^4, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^5, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^6, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^7, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^8, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^9, Conditions where both a and z in the violation condition 7 are odd

When 2a= z^{10}, Conditions where both a and z in the violation condition 7 are odd

When 2a=2z can derive a=z <c, violate the condition of a> c, in condition 7

When 2a=2 z^2 Can be introduced with a= z^2=c, condition of a> c in condition 7

When 2a=2 z^3 Can be introduced with a= z^3>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z^4 Can be introduced with a= z^4>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z^5 Can be introduced with a= z^5>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z^6 Can be introduced with a= z^6>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z7Can be introduced with a= z^7>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z8Can be introduced with a= z^8>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z9Can be introduced with a= z^9>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=2 z^{10} Can be introduced with a= z^{10}>2 z2=2c, violating the condition of a <2c in condition 8

When 2a=4z can derive a=2z <c, the condition of a> c and the parity of a in condition 7 are violated

When 2a=4 z^2 Can be introduced with a=2 z^2=2c, violating the parity of condition a with a <2c in condition 8

When 2a=4 z^3 Can be introduced with a= $2z^3$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=4 z^4 Can be introduced with a= $2z^4$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=4 z^5 Can be introduced with a= $2z^5$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=4 z^6 Can be introduced with a= $2z^6$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=4 z^7 Can be introduced with a= $2z^7$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=4 z^8 Can be introduced with a= $2z^8$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=4 z^9 Can be introduced with a= $2z^9$> 2c, the condition of

a <2c in violation condition 8, and the parity of a
When 2a=4 z^{10} Can be introduced with a= $2z^{10}$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=8z can launch a=4z, violating the parity of a in condition 7
When 2a=8 z^2 Can be introduced with a=4 z^2=4c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^3 Can be introduced with a= $4z^3$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^4 Can be introduced with a= $4z^4$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^5 Can be introduced with a= $4z^5$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^6 Can be introduced with a= $4z^6$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^7 Can be introduced with a= $4z^7$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^8 Can be introduced with a= $4z^8$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^9 Can be introduced with a= $4z^9$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=8 z^{10} Can be introduced with a= $4z^{10}$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=16z can launch a=8z, violating the parity of a in condition 7
When 2a=16 z^2 Can be introduced with a=8 z^2=8c, condition of a <2c in violation condition 8, and the parity of a
When 2a=16 z^3 Can be introduced with a= $8z^3$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16z^4 Can be introduced with a= $8z^4$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16z^5 Can be introduced with a= $8z^5$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16 z^6 Can be introduced with a= $8z^6$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16z^7 Can be introduced with a= $8z^7$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16z^8 Can be introduced with a= $8z^8$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16 z^9 Can be introduced with a= $8z^9$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=16z^{10} Can be introduced with a= $8z^{10}$> 2c, the condition of a <2c in violation condition 8, and the parity of a

When 2a=32z can introduce a=16z, violating the parity of a in condition 7
When 2a=32z^2 Can be launched with a=16 z^2=16c, condition of a <2c in violation condition 8, and parity of a
When 2a=32 z^3 Can be launched with a= $16z^3$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32z^4 Can be launched with a= $16z^4$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32z^5 Can be launched with a= $16z^5$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32 z^6 Can be launched with a= $16z^6$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32z^7 Can be launched with a= $16z^7$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32z^8 Can be launched with a= $16z^8$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32z^9 Can be launched with a= $16z^9$> 2c, the condition of a <2c in violation condition 8, and the parity of a
When 2a=32z^{10} Can be launched with a= $16z^{10}$> 2c, the condition of a <2c in violation condition 8, and the parity of a

Since inconsistent conclusions can be derived for each product factor, it can also be shown that for n=10, z is prime greater than or equal to $3^n + y^n = z^n$ No positive integer solution.

Using the above method, we can successively prove that, for the equation $x^n + y^n = z^n$, When n is an even number of 4 greater than or equal to 3 (6,10,14,18,....) And when z is a prime number greater than or equal to 3, a contradiction can be introduced, so there is no integer solution in this case, because Fermat himself has shown that the equation has no integer solution in the case of n=4, it can be proved for $x^n + y^n =$ when n> 2, there is no positive integer solution under the condition that the integer Z is prime, so the complete proof holds under the condition that the integer is prime and the power of the integer is greater than or equal to 3

3. Conclusion

In conclusion, this paper uses the symmetry replacement method, the enumeration method and the antithesis method to give a concise proof of the condition that the integer is prime, and the power of the integer is greater than or equal to 3. Since prime numbers are the basic composition of composite numbers, the authors also believe that the method will help to finally find the concise method of proof claimed by Fermat [1].

Reference

1. Cao Zexian, an excellent proof in the history of Mathematics, Foreign Language Teaching and Research Press, 2020