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PROOF OF THE TWIN PRIME CONJECTURE 2010 MATHEMATICS SUBJECT CLASSIFICATION 11AXX, 11A41

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ABSTRACT

The twin prime conjecture is a fundamental problem in number theory and it isoriginally based upon in the basic concept of Mathematics. Twin primes are theprimes of gap 2. In thi spaper, proof is of the twin primecon jectureisgoingtobepresented. In order to do that, the basic concept of proof of the formula forprime numbers has been connected with this proof. Originally it is a difficultproblem in observational space has beentransformed into general space th besolved. Through this research paper my approach is to provide a proof for thetwin primeconjecture.

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INTRODUCTION

The question of whether there exist infinitely many twin primes has been one of the major open unsolved problem in number theory since hundredof years .The twin prime conjecture statement is, "there are infinitely many primes p such that p+2 is also prime number. " In 1849 , Mathematician De Polignacmade the better known conjecture that for all natural number q,there are infinitely many primes such that p+2q is also prime number. The case q=1, of the Polignac'a conjecture is the twin prime conjecture. A stronger form of the twin prime conjecture, is called the Hardy- Littlewoods conjecture which concludes a distribution law for the twin primes to the prime number theorem indeed. On April 17,2003 Yitang Zhang , a Mathematician announced a proof that, for some integer N that is less than 70 million, there are infinitely many pairs of primes that differ from 70 million or less than that .His paper was published by Annals of Mathematics inearly 2013. Terrence Tao, a Mathematician, also proposed a polymath project to optimize the Zhang's bound.

METHODS

Twin prime conjecture," there are infinitely many twin primes ," based on a basic concept of Mathematics. The twin prime conjecture is very much connected with the prime numbers, the gap between them is 2. Therefore, we used the assumption that there are infinitely many primes, after proceeding with that we ended up with a contradiction, but the contradiction again contradicts that there are finitely many twin primes.

3. Proof of the Theorem: There are infinitely many twin primes. Before to establish that we have to establish another theorem's proof That is "there are infinitely many primes. The proof is, let us assume that there are finite number of primes. Also, let p be the last prime. And by arranging them in ascending order, We have 2,3,5,7, ………..Then, we can find a new number,

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say x =(2.3.5.7…………..p) +1 (*)

Now if x is prime ,then it makes a contradiction to our assumptions Therefore, there are infinitely many primes. Now, the Twin Primes are two consecutive primes of differences 2.
Let us, twin primes are (3,5), (5,7), (11,13), (17,19),(29,31),(41,43),(59,61),(71,73),(101,103),.. . . … It can be easily seen that all the twin primes are primes. We can write by comparing the multiplication of twin primes and primes in such a way as given below,

First twin primes are (3,5),first two primes are 2 and 3.

We have, 3.5 > 2.3 (1)

Next twin primes are (5, 7), and next two primes are 5 and 7.

We have, 3.5.5.7 > 2.3.5.7 (2)

Next twin primes are (11, 13) , next two primes are also 11 and 13.
3.5.5.7.11.13 > 2.3.5.7.11.13 (3)

Next twin primes are (17, 19) and two primes are 17and 19.

(3.5.5.7.11.13.17.19) > (2.3.5.7.11.13.17.19) (4)

Next twin primes are(29 , 31) ,primes are 23 and 29.

(3.5.5.7.11.13.17.19.29.31)>(2.3.5.7.11.13.17.19.23.29) (5)

After that next twin primes are (41 ,43) and primes are 31and37.

(3.5.5.7.11.13.17.19.29.31.41.43)> (2.3.5.7.11.13.17.19.23.29.31.37) (6)

Next twin primes are (59,61) two primes are 41and 43.

(3.5.5.7.............29.31.41.43.59.61) >(2.3.5...........23.29.31.37.41.43) (7)

Next twin primes are (71 ,73)and two primes are47 and 53.

(3.5.5.7.................................41.43.59.61.71.73)>

(2.3.5......31.37.41.43.47.53) (8)

Next twin primes are (101 ,103) , two primes are 59and 61.

(3.5.5.7. 71.73.101.103) >(2.3.5..........47.53.59.61) (9)

Now, if we assume that p is the last finite prime, And say p= 61, then it can be easily found that

(2.3.5.7.11.13.17.19............53 59.61) +1

Is also a prime as we can not find out any prime divisor of it. Also , for p=61 (say). In the LHS of the inequality, we have seen that The twin primes 101 and 103.By continuing the process in RHS if p is very large finite prime,

Then we have in LHS large twin primes.

For large value of p , we can write

(3.5.5.7.11............(p-2).p >(2.3.5.7...........p) (10)

And also,

{3.5.5.7.11. (p-2).p}>
{(2.3.5.7.............p)+1} (11)

In (11) ,the RHS always shows that it is originally x ,in our previous assumptions (*)

That is , x= (2.3.5.7.11.13 ....p)+1

which is sufficient to make a contradiction that" there are finitely many primes". Thus we can conclude that there are iinfinitely many primes. Now we have seenthat

{3.5.5.7.11.................................(p-2).p} > x

Thus inequality (11), shows that there are infinitely many twin primes.

CONCLUSSION

We can conclude that there are infinitely many twin primes . Hence the twin primeconjecture is true.

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