International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

A New Conjecture: Any Whole Number Greater than 3 has the Equal Distance from Two Prime Numbers

Mohammadreza Barghi

Independent Scholar
Email: Mreza7[at]yahoo.co

Abstract: ***This new conjecture say's that any whole number greater than 3, has equal distance from two prime numbers i.e. any whole number is in middle of two prime numbers. Forexample 8 is in the middle of 5 and 11 and its distance from 5 and 11 is equal t0 3, or 23 is in the middle of 17 and 31 and its distance from 17 and 31 is equal to 8.***

Keywords: number theory, prime, prime number, Goldbach, conjecture

1. Introduction

According to definition, prime numbers can't be written as multiplying of any whole numbers (whole numbers that are greater than 1) and there is no other known rule for predicting the prime numbers.

There are many facts, statements, solved and unsolved problems (conjectures) about prime numbers. some of them are more famous such as twine prime conjecture and Goldbach conjecture (4).

In this article I introduce a new conjecture about prime numbers and then I explain how this conjecture includes Goldbach's conjecture and how solving this conjecture, solves Goldbach's conjecture.

According to this new conjecture, any whole number has equal distance from two prime numbers i.e. each whole number is equal to half of the sum of two prime numbers and it is in the middle of these two prime numbers.

There may be more than one pair of prime numbers that a whole number sits in the middle of them.

Examples
Some examples for this conjecture:
7 is in the middle of 3 and 11
17 is in the middle of 11 1nd 23 and also in the middle of 5 and 29
43 is in the middle of 19 and 67 and also in the middle of 13 and 73 and in the middle of 7 and 79 and in the middle of 3 and 83.
163 is in the middle of 127 and 199 and in the middle of 97 and 229
In all above examples, distance of the mentioned whole number from two prime numbers are equal.
You can find at least one pair of prime numbers for any whole number that sits in the middle of them.

2. Discussion

I am interested in number theory and I introduced a new number cycle in another articles [1,2] and here I am trying to introduce a new conjecture about prime numbers. A prime number is a whole an integer greater than 1 that has no positive divisors other than 1 and itself [3].Prime numbers were known from the ancient times. Euclid around 300 B,C demonstrate there are infinitely prime numbers. There are no known formulas separates prime numbers from composite numbers. There are many conjectures around prime numbers such as a conjecture about infinite twine prime numbers and Goldbach's conjecture that say's any even number could be written as sum of two prime numbers.

Here I declare that any whole number greater then 3 is in the middle of two prime numbers and it could be tested for all of the whole numbers greater than 3 similar to above examples.

Effect on Goldbach's conjecture
If this conjecture be solved, then Goldbach's conjecture will be easily solved. if we could prove that any whole number greater than 3 is in the middle of two prime numbers (as my conjecture says), it means that sum of these two prime numbers is equal to that whole number multiplied by two that produce an even number. Because any even number can be divided by two and the result is a whole number that sits in the middle of two prime numbers, then the sum of these two prime numbers is equal to that even number. Let me show you some examples:

Example 1:
14 is an even number and 14 divided by two is 7, 7 is in the middle of 3 and 11,and 3 plus 11 is 14 i.e 14 is sum of two prime numbers.

Example 2:
66 is an even number and 66 divided by 2 is 33, 33 is in the middle of 29 and 37,and 29 plus 37 is 66 i.e. 66 is sum of two prime numbers.

Example 3:

244 is an even number and 244 divided by two is 122, 122 is in the middle of 113 and 131, and 113 plus 131 is equal to 244 i.e.244 is sum of two prime numbers.

Other finding about numbers with this conjecture
If this conjecture be solved, we can say that any whole number greater than 3 is sum of two prime numbers divided by 2 i. e. we can produce any whole number greater than 3 by adding two prime numbers and dividing the result by 2. This could be explained easily: because if a number is in the middle of two prime numbers, then it is half of the sum of these prime numbers. Again let me show you some examples:

Example 1:
10 is in the middle of 7 and 13, therefore it is half of the 7 plus 13.

Example 2:
27 is in the middle of 23 and31, therefore it is half of the 23 plus 31.

Example 3;
145 is in the middle of 139 and 151, therefore it is half of the 139 plus 151.

3. Conclusion

Any whole number greater than3 is in the middle of two prime numbers i.e. any whole number greater than 3 has the equal distance from two prime numbers. This is a conjecture and needs to be solved.

In addition, if this conjecture be solved, the Goldbach's conjecture could be solved easily.

A side finding of this conjecture is that we can say any whole number greater than 3 is equal to half of the sum of 2 prime numbers.

References

[1] Mohammadreza Barghi , "An Interesting Number Cycle that takes Two Consecutive Integers (a, b) and Integer (c), and with any c, it Always Returns a or b.", **IJSR** Volume 11 Issue 12, December 2022, 555-556
[2] Mohammadreza Barghi , "explanation for the Number Cycle that was introduced by Mohammadreza Barghi.", **IJSR** Volume 12 Issue 1, January 2023, 1032-1033
[3] Dudley, Underwood (1978). "section2: Unique factorization". Elementary number theory. (2nd ed.) W.H. Freeman and Co. p. 10. ISBA 978-0-7167-0076-0.
[4] Oliveira e Silva, Tomas. "Goldbach's conjecture verification". sweet.ua.pt

Author Profile

Mohammadreza Barghi lives in Calgary, Alberta, Canada. He is interested in numerical math and before he had two article about a number cycle and explanation for this cycle. In this article he introduced a new conjecture about prime numbers. It might be interesting for other peoples and also may add something to the science. Author would appreciate if opinion about this conjecture be sent at Email address: mreza7@yahoo.com