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All Prime Numbers Greater than 3 Could be Written as 1 + Multiplying of More than 2 Prime Numbers but vice versa is Not True

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Abstract: ***According to definition, prime numbers can't be written as multiplying of any whole numbers (whole numbers that are greater than 1) but we can write prime numbers that are greater than 3 as: 1 + multiplying of two or more prime numbers. Vice versa of this issue is not true i.e. not all numbers that produced by adding 1 to multiplying of some prime numbers are prime numbers.***

Keywords: number theory, prime, prime number

1. Introduction

I am interested to number theory and I introduced a new number cycle in another articles [1, 2] and here I am trying to explain a special feature of prime numbers. A prime number is a wholean 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. Prime numbers can't be written as multiplication of whole numbers greater than 1, Because all prime numbers greater than 2 are odd numbers, here I will show that each prime number greater than 3 could be broken to 1 + multiplying of 2 or more prime numbers but vice versa is not true, in other words, we can't make prime numbers by multiplying some prime numbers and adding 1 to them all the times.

2. Discussion

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 am explaining two related statements about prime numbers.

First statement: as we know every prime number greater than 2 is odd, then reducing 1 from one of these prime numbers results in an even number and each even number could be written as a number multiplied by 2, for example 7 could be written as 1 + 2*3 or 23 could be written as 1 + 2*11 or 29 could be written as 1 + 2* 2*7; therefore each prime number greater than 3 could be written as: 1 + multiplying of 2 or more prime numbers. From all of the prime numbers only 2 and 3 can't be written as: 1 + multiplying of multiple prime numbers.2 minus 1 is 1 and 3 minus 1 is 2, so both 1 and 2 can't be written as multiplying of prime numbers.

Second statement: Vice versa of the above statement i. e multiplying some prime numbers and adding 1 to it do not produce a prime number all the times. We should consider two groups of multiplying of prime numbers: multiplying of odd prime numbers (prime numbers except 2) and multiplying of even prime number (2) by other prime numbers. Multiplying the odd prime numbers produce an odd number that adding 1 to it results an even number that is not a prime number. Beside, multiplying any prime numbers by 2 and adding 1 to the results will produce odd numbers that some of them are prime and some of them are not. For example multiplying 2 by 3 and adding 1 to it, produces 7 that is a prime number but multiplying 2 by 7 and adding 1 to it, produces 15 that is not a prime number. According to current knowledge we are not able to predict which of these products will be prime.

3. Conclusion

All prime numbers greater than 3 could be written as: 1 + multiplying of 2 or more prime numbers but vice versa is not true i. e. we can't obtain a prime number by adding 1 to multiplying of some prime numbers all the times.

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Author Profile

Mohammadreza Barghi lives in Calgary, Alberta, Canada. He is interested in numerical math and before He had two articles about a number cycle and explanation for this cycle. In this article author has explained about some properties of prime numbers. Author considers it might be interesting for other peoples. Email address: mreza7[at]yahoo.com