Special cases of Goldbach conjecture: For every even integer 2n, there exists infinite integers “d” greater than one, such that the product 2nd, may be expressed as sum of two primes

Abstract: In this paper, we show that for all even integers “2n”, there exists infinite positive integers “d” greater than one, such that their product “2nd” is a sum of two primes. Any two odd primes add to give even integers. However this general method does not allow us to understand the property or relationship among even numbers numbers derived in this manner. On the other hand, our results suggests existence of even integers of the specific form “2nd” that can be written as a sum of two primes.

Results:

Consider an even integer 2n, where n=1,2,3,……..

Then for each 2n, there exists integers 2n-1 and 2n+1 which are both co-prime to 2n.

Therefore by Dirichlet’s theorem of arithmetic progressions, infinite integers a and b exist such that

(2n-1)+a(2n)=p, where p is prime ……………..(1)

and

(2n+1)+b(2n)=q, where q is prime ………………..(2)

Adding the two equations (1) and (2)

4n+2n(a+b)=p+q …………….. (sum of two primes)

2n(2+a+b)=p+q

Replacing (2+a+b) by integer d, we get

2nd = p+q

This suggests that for every even integer 2n, there exists infinite number of suitable integers “d” where d is greater than one, such the product 2nd can be expressed as the sum of two primes.

For each such even integer “2nd”, the even Goldbach conjecture is true.

In a special case when a and b are both zero, and 2n-1 and 2n+1 are twin primes, d takes the minimum value of 2.