The suggestion that 2-probable primes satisfying Even Goldbach conjecture are possible

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Abstract: The even Goldbach conjecture suggests that every even integer greater than four may be written as the sum of two odd primes. This conjecture remains unproven. We explore whether two probable primes satisfying the Fermat's little theorem can potentially exist for every even integer greater than four. Our results suggest that there are no obvious constraints on this possibility.

Results:

Let every even integer 2n greater than four be expressible as the sum of two probable odd primes p and q.

Then 2n=p+q

And by definition of 2-probable primes using Fermat's little theorem

$2^{p-1} \cong 1 \bmod(p)$
$2^{q-1} \cong 1 \bmod(q)$

$2^{p-1} = (px+1)$, where x is a specific odd integer
$2^{q-1} = (qy+1)$, where y is a specific odd integer

$2^{p-1}.\ 2^{q-1} = (px+1)(qy+1)$

$2^{p+q-2} = pqxy + px + qy + 1$

$2^{2n-2} = pqxy + px + qy + 1$

$4^{n-1} = pqxy + px + qy + 1$

$4^{n-1} – pqxy – px – qy = 1$ …………………..(I)

We are interested in all cases where n is a positive integer greater than 2. Since p and q are two probable odd primes, therefore gcd $(4^{n-1}, pq, p, q)=1$

and by Bezout's identity it should be possible to find integers a, b, c, d such that

$a.4^{n-1} + b.pq + c.p + d.q = 1$

Expression (I)
$4^{n-1} – pqxy – px – qy = 1$, is one such form.

With a=1, b=-xy, c=-x and d=-y, that must be satisfied for the Even Goldbach to be true.