On The Prime Equatons: $P, jP+9-j(j=1,2,4,5,7,8)$

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Abstract: Using Jiang function we prove that there exist infinitely many primes P such that each $jP+9-j$ is a prime.

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Theorem

$$P, jP+9-j(j=1,2,4,5,7,8) \quad (1)$$

There exist infinitely many primes P such that each of $jP+9-j$ is a prime.

Proof. We have Jiang function[1]

$$J_2(\omega)=\prod_P[P-1-\chi(P)], \quad (2)$$

where $\omega=\prod_P P$,

$\chi(P)$ is the number of solutions of congruence

$$\Pi(jq+9-j)(j=1,2,4,5,7,8)\equiv 0 \pmod P \quad (3)$$

$$q=1,\cdots,P-1.$$

From (3) we have $\chi(2)=0$, $\chi(3)=1$, $\chi(5)=3$, $\chi(7)=3$, $\chi(P)=6$ otherwise.

From (3) and (2) we have

$$J_2(\omega)=3\prod_{11\le P}(P-7)\neq 0. \quad (4)$$

We prove that there exist infinitely many primes P such that $jP+9-j$ is a prime.

We have the best asymptotic formula [1]

$$\pi_7(N,2)=\left|\{P\le N: jP+9-j=prime\}\right|\sim \frac{J_2(\omega)\omega^6}{\phi^7(\omega)}\frac{N}{\log^7 N}, \quad (5)$$

where $\phi(\omega)=\prod_P(P-1)$.

Reference

1. Chun-Xuan Jiang, Jiang's function $J_{n+1}(\omega)$ in prime distribution. http://www. wbabin.net/math /xuan2. pdf.
2. Chun-Xuan Jiang. **Automorphic Functions And Fermat's Last Theorem (1).** *Rep Opinion* 2012;4(8):1-6]. (ISSN: 1553-9873). http://www.sciencepub.net/report/report0408/001_10009report0408_1_6.pdf.
3. Chun-Xuan Jiang. **Jiang's function $J_{n+1}(\omega)$ in prime distribution.** *Rep Opinion* 2012;4(8):28-34]. (ISSN: 1553-9873). http://www.sciencepub.net/report/report0408/007_10015report0408_28_34.pdf.
4. Chun-Xuan Jiang**. The Hardy-Littlewood prime *k*-tuple conjecture is false.** *Rep Opinion* 2012;4(8):35-38]. (ISSN: 1553-9873). http://www.sciencepub.net/report/report0408/008_10016report0408_35_38.pdf.
5. Chun-Xuan Jiang. **A New Universe Model.** *Academ Arena* 2012;4(7):12-13] (ISSN 1553-992X). http://sciencepub.net/academia/aa0407/003_10067aa0407_12_13.pdf.

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