The New Prime theorems（391）-（440）

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Abstract: Using Jiang function $J_2(\omega)$ we prove that the new prime theorems (341)-（390) contain infinitely many prime solutions and no prime solutions. Analytic and combinatorial number theory (August 29-September 3, ICM2010) is a conjecture. The sieve methods and circle method are outdated methods which cannot prove twin prime conjecture and Goldbach's conjecture. The papers of Goldston-Pintz-Yildirim and Green-Tao are based on the Hardy-Littlewood prime k-tuple conjecture (1923). But the Hardy-Littlewood prime k-tuple conjecture is false: (http://www.wbabin.net/math/xuan77.pdf) (http://vixra.org/pdf/1003.0234v1.pdf). Mathematicians do not speak advanced mathematical papers in ICM2010. ICM2010 is lower congress.

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The New Prime theorem（391）

$$P, jP^{702}+k-j (j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{702}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{702}+k-j (j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P [P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{702}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{702}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{702}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(702)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,7,19,79,139$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,7,19,79,139$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,7,19,79,139$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,7,19,79,139$,

(1) contain infinitely many prime solutions

The New Prime theorem（392）

$$P, jP^{704}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{704}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{704}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{704}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{704}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{704}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(704)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,17,23,89,353$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,17,23,89,353$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,17,23,89,353$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,5,17,23,89,353$
(1) contain infinitely many prime solutions

The New Prime theorem（393）

$$P, jP^{706}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{706}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{706}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{706}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{706}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\{P\le N: jP^{706}+k-j=prime\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(706)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k>3$,

(1) contain infinitely many prime solutions

The New Prime theorem（394）

$$P, jP^{708}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{708}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{708}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{708}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{708}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{708}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(708)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,7,13,709$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,7,13,709$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,7,13,709$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,5,7,13,709$

(1) contain infinitely many prime solutions

The New Prime theorem（395）

$$P, jP^{710}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{710}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{710}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{710}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{710}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\{P\le N: jP^{710}+k-j=prime\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(710)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,11$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,11$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,11$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,11$

(1) contain infinitely many prime solutions

The New Prime theorem（396）

$$P, jP^{712}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{712}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{712}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{712}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{712}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{712}+k-j=prime\right\}\right|\sim \frac{J_2(\omega)\omega^{k-1}}{(712)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k\neq 3,5$,

(1) contain infinitely many prime solutions

The New Prime theorem（397）

$$P, jP^{714}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{714}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{714}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{714}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes

P such that each of $jp^{714}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{714}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(714)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,7,43,103$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,7,43,103$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,7,43,103$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,7,43,103$,

(1) contain infinitely many prime solutions

The New Prime theorem（398）

$$P, jP^{716}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{716}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{716}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{716}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{716}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{716}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(716)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5,359$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5,359$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,359$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k\neq 3,5,359$,
(1) contain infinitely many prime solutions

The New Prime theorem（399）

$$P, jP^{718}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{718}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{718}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{718}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega) \neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{718}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{718}+k-j=prime\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(718)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k>3$,

(1) contain infinitely many prime solutions

The New Prime theorem（400）

$$P, jP^{720}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{720}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{720}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{720}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{720}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\{P\le N: jP^{720}+k-j=prime\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(720)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5,7,11,13,17,19,31,37,41,61,73,181,241$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5,7,11,13,17,19,31,37,41,61,73,181,241$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,7,11,13,17,19,31,37,41,61,73,181,241$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k\neq 3,5,7,11,13,17,19,31,37,41,61,73,181,241$,
(1) contain infinitely many prime solutions

The New Prime theorem（401）

$$P, jP^{722}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{722}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{722}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{722}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P) \le P-2$ then from (2) and (3) we have

$$J_2(\omega) \ne 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{722}+k-j$ is a prime.

If $\chi(P) = P-1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2) = \left|\left\{P \le N : jP^{722}+k-j = prime\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(722)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega) = 0 \tag{7}$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega) \ne 0 \tag{8}$$

We prove that for $k>3$,

(1) contain infinitely many prime solutions

The New Prime theorem（402）

$$P, jP^{724}+k-j (j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{724}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{724}+k-j (j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_P [P-1-\chi(P)] \tag{2}$$

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1} \left[jq^{724}+k-j \right] \equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{724}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{724}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(724)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>5$.
From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k>5$,
(1) contain infinitely many prime solutions

The New Prime theorem（403）

$$P, jP^{726}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{726}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{726}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{726}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P) \le P-2$ then from (2) and (3) we have

$$J_2(\omega) \ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{726}+k-j$ is a prime.

If $\chi(P) = P-1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2) = \left|\left\{P \le N : jP^{726}+k-j = prime\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(726)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k = 3,7,23,67,727$. From (2) and(3) we have

$$J_2(\omega) = 0 \quad (7)$$

we prove that for $k = 3,7,23,67,727$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \ne 3,7,23,67,727$.
From (2) and (3) we have

$$J_2(\omega) \ne 0 \quad (8)$$

We prove that for $k \ne 3,7,23,67,727$,
(1) contain infinitely many prime solutions

The New Prime theorem（404）

$$P, jP^{728}+k-j (j = 1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{728}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{728}+k-j (j = 1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{728}+k-j\right]\equiv 0 \pmod P), q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{728}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{728}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(728)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,29,53$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,29,53$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,29,53$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,29,53$,

(1) contain infinitely many prime solutions

The New Prime theorem（405）

$$P, jP^{730}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{730}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{730}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{730} + k - j \right] \equiv 0 \pmod P, q = 1, \cdots, P-1 \tag{3}$$

If $\chi(P) \le P-2$ then from (2) and (3) we have

$$J_2(\omega) \ne 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{730} + k - j$ is a prime.

If $\chi(P) = P-1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2) = \left|\left\{P \le N : jP^{730} + k - j = prime\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(730)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k = 3,11$. From (2) and(3) we have

$$J_2(\omega) = 0 \tag{7}$$

we prove that for $k = 3,11$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \ne 3,11$.

From (2) and (3) we have

$$J_2(\omega) \ne 0 \tag{8}$$

We prove that for $k \ne 3,11$,

(1) contain infinitely many prime solutions

The New Prime theorem（406）

$$P, jP^{732} + k - j (j = 1, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jP^{732} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{732} + k - j (j = 1, \cdots, k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{732}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \qquad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \qquad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{732}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \qquad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\{P\le N: jP^{732}+k-j=prime\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(732)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \qquad (6)$$

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

Example 1. Let $k=3,5,7,13,367,733$. From (2) and(3) we have

$$J_2(\omega)=0 \qquad (7)$$

we prove that for $k=3,5,7,13,367,733$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,7,13,367,733$.
From (2) and (3) we have

$$J_2(\omega)\ne 0 \qquad (8)$$

We prove that for $k\ne 3,5,7,13,367,733$,
(1) contain infinitely many prime solutions

The New Prime theorem（407）

$$P, jP^{734}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{734}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{734}+k-j(j=1,\cdots,k-1). \qquad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{734}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \qquad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \qquad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{734}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \qquad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{734}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(734)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \qquad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \qquad (7)$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \qquad (8)$$

We prove that for $k>3$,

(1) contain infinitely many prime solutions

The New Prime theorem（408）

$$P, jP^{736}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{736}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{736}+k-j(j=1,\cdots,k-1). \qquad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{736}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{736}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\{P\le N: jP^{736}+k-j=prime\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(736)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,17,47$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,17,47$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,17,47$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,17,47$,

(1) contain infinitely many prime solutions

The New Prime theorem（409）

$$P, jP^{738}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{738}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{738}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{738}+k-j\right]\equiv 0 \pmod P), q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{738}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{738}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(738)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,7,19,739$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,7,19,739$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,7,19,739$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \tag{8}$$

We prove that for $k\ne 3,7,19,739$,

(1) contain infinitely many prime solutions

The New Prime theorem（410）

$$P, jP^{740}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{740}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{740}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{740}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{740}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{740}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(740)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,11,149$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,11,149$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,11,149$.
From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,11,149$,
(1) contain infinitely many prime solutions

The New Prime theorem（411）

$$P, jP^{742}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{742}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{742}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{742}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{742}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{742}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(742)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,107,743$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,107,743$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,107,743$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,107,743$,

(1) contain infinitely many prime solutions

The New Prime theorem（412）

$$P, jP^{744}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{744}+k-j$ contain infinitely many prime solutions and no prime

solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{744}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{744}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{744}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{744}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(744)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,7,13,373$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,7,13,373$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,7,13,373$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,7,13,373$,

(1) contain infinitely many prime solutions

The New Prime theorem（413）

$$P, jP^{746}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{746}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{746}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{746}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{746}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{746}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(746)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k>3$,

(1) contain infinitely many prime solutions

The New Prime theorem（414）

$$P, jP^{748}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{748}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{748}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{748}+k-j\right]\equiv 0 \pmod P), q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{748}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{748}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(748)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,23$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,23$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,23$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,23$,

(1) contain infinitely many prime solutions

The New Prime theorem（415）

$$P, jP^{750}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{750}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{750}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{750}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{750}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{750}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(750)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,7,11,31,151,751$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,7,11,31,151,751$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,7,11,31,151,751$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,7,11,31,151,751$,

(1) contain infinitely many prime solutions

The New Prime theorem（416）

$$P, jP^{752}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{752}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{752}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{752}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{752}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{752}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(752)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,17$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,17$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,17$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,5,17$,

(1) contain infinitely many prime solutions

The New Prime theorem（417）

$$P, jP^{754}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{754}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{754}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{754}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{754}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{754}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(754)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,59$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,59$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,59$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,59$,

(1) contain infinitely many prime solutions

The New Prime theorem（418）

$$P, jP^{756}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{756}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{756}+k-j(j=1,\cdots,k-1) \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{756}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{756}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{756}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(756)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5,7,13,19,29,37,43,127,379,757$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5,7,13,19,29,37,43,127,379,757$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,7,13,19,29,37,43,127,379,757$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \tag{8}$$

We prove that for $k\ne 3,5,7,13,19,29,37,43,127,379,757$,

(1) contain infinitely many prime solutions

The New Prime theorem（419）

$$P, jP^{758}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{758}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{758}+k-j(j=1,\cdots,k-1) \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{758}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{758}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{758}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(758)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k>3$,
(1) contain infinitely many prime solutions

The New Prime theorem（420）

$$P, jP^{760}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{720}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{760}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{760}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{760}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{760}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(760)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,11,41,191,761$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,11,41,191,761$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,11,41,191,761$.
From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,11,41,191,761$,
(1) contain infinitely many prime solutions

The New Prime theorem（421）

$$P, jP^{762}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{762}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{762}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{762}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{762}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{762}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(762)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,7$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,7$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,7$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,7$,

(1) contain infinitely many prime solutions

The New Prime theorem（422）

$$P, jP^{764}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{764}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{764}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{764}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{764}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{764}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(764)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,383$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,383$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,383$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,5,383$,

(1) contain infinitely many prime solutions

The New Prime theorem（423）

$$P, jP^{766}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{766}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{766}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{766}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{766}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{766}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(766)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k>3$,

(1) contain infinitely many prime solutions

The New Prime theorem（424）

$$P, jP^{768}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{768}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{768}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{768}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{768}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{768}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(768)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,7,13,17,97,193,257,769$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,7,13,17,97,193,257,769$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,7,13,17,97,193,257,769$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,5,7,13,17,97,193,257,769$,

(1) contain infinitely many prime solutions

The New Prime theorem（425）

$$P, jP^{770}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{770}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{770}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{770}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{770}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{770}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(770)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,11,23,71$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,11,23,71$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,11,23,71$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k\ne 3,11,23,71$,

(1) contain infinitely many prime solutions

The New Prime theorem（426）

$$P, jP^{772}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{772}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{772}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{772}+k-j\right]\equiv 0 \pmod P), q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{772}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{772}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(772)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5,773$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5,773$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,773$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \tag{8}$$

We prove that for $k\ne 3,5,773$,

(1) contain infinitely many prime solutions

The New Prime theorem（427）

$$P, jP^{774}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{774}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{774}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{774}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{774}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{774}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(774)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,7,19$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,7,19$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,7,19$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k\neq 3,7,19$,

(1) contain infinitely many prime solutions

The New Prime theorem（428）

$$P, jP^{776}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{776}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{776}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{776}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{776}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\ne 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{776}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(776)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,389$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,389$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\ne 3,5,389$.

From (2) and (3) we have

$$J_2(\omega)\ne 0 \quad (8)$$

We prove that for $k \neq 3,5,389$,
(1) contain infinitely many prime solutions

The New Prime theorem（429）

$$P, jP^{778}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{778}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{778}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{778}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{778}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{778}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(778)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k > 3$,
(1) contain infinitely many prime solutions

The New Prime theorem (430)

$$P, jP^{780} + k - j (j = 1, \cdots, k-1)$$

Chun-Xuan Jiang
Jiangchunxuan@vip.sohu.com

Abstract

Using Jiang function we prove that $jP^{780} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{780} + k - j (j = 1, \cdots, k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_P [P - 1 - \chi(P)] \tag{2}$$

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1} \left[jq^{780} + k - j \right] \equiv 0 \pmod P, q = 1, \cdots, P-1 \tag{3}$$

If $\chi(P) \leq P - 2$ then from (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{780} + k - j$ is a prime.

If $\chi(P) = P - 1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N, 2) = \left| \left\{ P \leq N : jP^{780} + k - j = prime \right\} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(780)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k = 3, 5, 7, 11, 13, 31, 53, 61, 79, 131, 157$. From (2) and(3) we have

$$J_2(\omega) = 0 \tag{7}$$

we prove that for $k = 3, 5, 7, 11, 13, 31, 53, 61, 79, 131, 157$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \neq 3, 5, 7, 11, 13, 31, 53, 61, 79, 131, 157$.

From (2) and (3) we have

$J_2(\omega) \neq 0$ （8）

We prove that for $k \neq 3,5,7,11,13,31,53,61,79,131,157$,
(1) contain infinitely many prime solutions

The New Prime theorem（431）

$$P, jP^{782} + k - j (j = 1, \cdots, k-1)$$

Chun-Xuan Jiang
Jiangchunxuan@vip.sohu.com

Abstract

Using Jiang function we prove that $jP^{782} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$P, jP^{782} + k - j (j = 1, \cdots, k-1)$. （1）

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$\prod_{j=1}^{k-1} \left[jq^{782} + k - j \right] \equiv 0 \pmod P, q = 1, \cdots, P-1$ （3）

If $\chi(P) \leq P-2$ then from (2) and (3) we have

$J_2(\omega) \neq 0$ （4）

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{782} + k - j$ is a prime.

If $\chi(P) = P - 1$ then from (2) and (3) we have

$J_2(\omega) = 0$ （5）

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \neq 0$ then we have asymptotic formula [1,2]

$\pi_k(N,2) = \left| \left\{ P \leq N : jP^{782} + k - j = prime \right\} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(782)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}$ （6）

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

Example 1. Let $k = 3, 47$. From (2) and(3) we have

$J_2(\omega) = 0$ （7）

we prove that for $k = 3, 47$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \neq 3, 47$.

From (2) and (3) we have

$$J_2(\omega) \neq 0 \quad (8)$$

We prove that for $k \neq 3,47$,
(1) contain infinitely many prime solutions

The New Prime theorem（432）

$$P, jP^{784}+k-j (j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{784}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{784}+k-j (j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{784}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{784}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{784}+k-j=prime\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(784)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,5,17,29,113,197$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,17,29,113,197$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,17,29,113,197$.

From (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{8}$$

We prove that for $k \neq 3,5,17,29,113,197$,
(1) contain infinitely many prime solutions

The New Prime theorem（433）

$$P, jP^{786} + k - j (j = 1, \cdots, k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{786} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{786} + k - j (j = 1, \cdots, k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_P [P - 1 - \chi(P)] \tag{2}$$

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1} \left[jq^{786} + k - j \right] \equiv 0 \pmod P, q = 1, \cdots, P-1 \tag{3}$$

If $\chi(P) \leq P - 2$ then from (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{786} + k - j$ is a prime.

If $\chi(P) = P - 1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N, 2) = \left| \left\{ P \leq N : jP^{786} + k - j = prime \right\} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(786)^{k-1} \phi^k(\omega)} \frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k = 3, 7, 263, 787$. From (2) and(3) we have

$$J_2(\omega) = 0 \tag{7}$$

we prove that for $k = 3, 7, 263, 787$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \neq 3, 7, 263, 787$.

From (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{8}$$

We prove that for $k \neq 3,7,263,787$,
(1) contain infinitely many prime solutions

The New Prime theorem（434）

$$P, jP^{788}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{788}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{788}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{788}+k-j\right] \equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P) \leq P-2$ then from (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{788}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P \leq N: jP^{788}+k-j=prime\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(788)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \neq 3,5$.

From (2) and (3) we have

$$J_2(\omega) \neq 0 \qquad (8)$$

We prove that for $k \neq 3,5$,

(1) contain infinitely many prime solutions

The New Prime theorem（435）

$$P, jP^{790} + k - j (j = 1, \cdots, k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{790} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{790} + k - j (j = 1, \cdots, k-1). \qquad (1)$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

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

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1} \left[jq^{790} + k - j \right] \equiv 0 \pmod P, q = 1, \cdots, P-1 \qquad (3)$$

If $\chi(P) \leq P - 2$ then from (2) and (3) we have

$$J_2(\omega) \neq 0 \qquad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{790} + k - j$ is a prime.

If $\chi(P) = P - 1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \qquad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N, 2) = \left| \{ P \leq N : jP^{790} + k - j = prime \} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(790)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N} \qquad (6)$$

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

Example 1. Let $k = 3, 11$. From (2) and(3) we have

$$J_2(\omega) = 0 \qquad (7)$$

we prove that for $k = 3, 11$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k \neq 3,11$.

From (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{8}$$

We prove that for $k \neq 3,11$,

(1) contain infinitely many prime solutions

The New Prime theorem（436）

$$P, jP^{792} + k - j(j = 1, \cdots, k-1)$$

Chun-Xuan Jiang
Jiangchunxuan@vip.sohu.com

Abstract

Using Jiang function we prove that $jP^{792} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{792} + k - j(j = 1, \cdots, k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_P [P - 1 - \chi(P)] \tag{2}$$

where $\omega = \prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1} \left[jq^{792} + k - j \right] \equiv 0 \pmod P, q = 1, \cdots, P-1 \tag{3}$$

If $\chi(P) \leq P - 2$ then from (2) and (3) we have

$$J_2(\omega) \neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{792} + k - j$ is a prime.

If $\chi(P) = P - 1$ then from (2) and (3) we have

$$J_2(\omega) = 0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega) \neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N, 2) = \left| \left\{ P \leq N : jP^{792} + k - j = prime \right\} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(792)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k = 3, 5, 7, 13, 19, 37, 67, 73, 199, 397$. From (2) and(3) we have

$$J_2(\omega) = 0 \tag{7}$$

we prove that for $k=3,5,7,13,19,37,67,73,199,397$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,7,13,19,37,67,73,199,397$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,5,7,13,19,37,67,73,199,397$,
(1) contain infinitely many prime solutions

The New Prime theorem（437）

$$P, jP^{794}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{794}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{794}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{794}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{794}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{794}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(794)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3$,

(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k>3$.

From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k=3$,

(1) contain infinitely many prime solutions

The New Prime theorem（438）

$$P, jP^{796}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
Jiangchunxuan@vip.sohu.com

Abstract

Using Jiang function we prove that $jP^{796}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{796}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{796}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{796}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{796}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(796)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5,797$. From (2) and(3) we have

$$J_2(\omega)=0 \quad (7)$$

we prove that for $k=3,5,797$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,797$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (8)$$

We prove that for $k\neq 3,5,797$,
(1) contain infinitely many prime solutions

The New Prime theorem（439）

$$P, jP^{798}+k-j(j=1,\cdots,k-1)$$

Chun-Xuan Jiang
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Abstract

Using Jiang function we prove that $jP^{798}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{798}+k-j(j=1,\cdots,k-1). \quad (1)$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

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

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{798}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \quad (3)$$

If $\chi(P)\leq P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \quad (4)$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{798}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \quad (5)$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\leq N: jP^{798}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(798)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \quad (6)$$

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

Example 1. Let $k=3,7,43$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,7,43$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,7,43$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k\neq 3,7,43$,
(1) contain infinitely many prime solutions

The New Prime theorem（440）

$$P, jP^{800}+k-j(j=1,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jP^{800}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$P, jP^{800}+k-j(j=1,\cdots,k-1). \tag{1}$$

contain infinitely many prime solutions and no prime solutions.
Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_P[P-1-\chi(P)] \tag{2}$$

where $\omega=\prod_P P$, $\chi(P)$ is the number of solutions of congruence

$$\prod_{j=1}^{k-1}\left[jq^{800}+k-j\right]\equiv 0 \pmod P, q=1,\cdots,P-1 \tag{3}$$

If $\chi(P)\le P-2$ then from (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{4}$$

We prove that (1) contain infinitely many prime solutions that is for any k there are infinitely many primes P such that each of $jp^{800}+k-j$ is a prime.

If $\chi(P)=P-1$ then from (2) and (3) we have

$$J_2(\omega)=0 \tag{5}$$

We prove that (1) contain no prime solutions [1,2]

If $J_2(\omega)\neq 0$ then we have asymptotic formula [1,2]

$$\pi_k(N,2)=\left|\left\{P\le N: jP^{800}+k-j=prime\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(800)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N} \tag{6}$$

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

Example 1. Let $k=3,5,11,17,41,101,401$. From (2) and(3) we have

$$J_2(\omega)=0 \tag{7}$$

we prove that for $k=3,5,11,17,41,101,401$,
(1) contain no prime solutions. 1 is not a prime.

Example 2. Let $k\neq 3,5,11,17,41,101,401$.
From (2) and (3) we have

$$J_2(\omega)\neq 0 \tag{8}$$

We prove that for $k\neq 3,5,11,17,41,101,401$,
(1) contain infinitely many prime solutions

Remark. The prime number theory is basically to count the Jiang function $J_{n+1}(\omega)$ and Jiang prime k -tuple singular series $\sigma(J)=\frac{J_2(\omega)\omega^{k-1}}{\phi^k(\omega)}=\prod_P\left(1-\frac{1+\chi(P)}{P}\right)(1-\frac{1}{P})^{-k}$ [1,2], which can count the number of prime numbers. The prime distribution is not random. But Hardy-Littlewood prime k -tuple singular series $\sigma(H)=\prod_P\left(1-\frac{\nu(P)}{P}\right)(1-\frac{1}{P})^{-k}$ is false [3-17], which cannot count the number of prime numbers[3].

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