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The New Prime theorems (1191)—（1240）

Chun-Xuan Jiang

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Abstract: Using Jiang function we are able to prove almost all prime problems in prime distribution. This is the Book proof. No great mathematicians study prime problems and prove Riemann hypothesis in AIM, CLAYMA, IAS, THES, MPIM, MSRI. In this paper using Jiang function $J_2(\omega)$ we prove that the new prime theorems (1191)-(1240) contain infinitely many prime solutions and no prime solutions. From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$. This is the Book theorem. It will be another million years at least, before we understand the primes.

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The New Prime Theorem (1191)

$$p, jp^{2302}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2302}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2302}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2302}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2302}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2302}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2302)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k\neq 3$

From (2) and (3) we have

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

We prove that for $k\neq 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1192)

$$p, jp^{2304}+k-j (j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2304}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2304}+k-j (j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2304}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2304}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\leq N: jp^{2304}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2304)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\geq 1$.

Example 1. Let $k=3,5,7,13,17,19,37,73,97,193,577,769,1153$

From (2) and (3) we have

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

We prove that for $k=3,5,7,13,17,19,37,73,97,193,577,769,1153$

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

Example 2. Let $k\neq 3,5,7,13,17,19,37,73,97,193,577,769,1153$

From (2) and (3) we have

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

We prove that for $k\neq 3,5,7,13,17,19,37,73,97,193,577,769,1153$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1193)

$$p, jp^{2306}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2306}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2306}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2306}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2306}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2306}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2306)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k\ne 3$

From (2) and (3) we have

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

We prove that for $k\ne 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1194)

$$p, jp^{2308}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2308}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2308}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2308}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2308}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2308}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2308)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,2309$

From (2) and (3) we have

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

We prove that for $k=3,5,2309$

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

Example 2. Let $k\neq 3,5,2309$

From (2) and (3) we have

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

We prove that for $k\neq 3,5,2309$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1195)

$$p, jp^{2310}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2310}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2310}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2310}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2310}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P \le N : jp^{2310}+k-j=\text{prime}\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2310)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2) \ge 1$.

Example 1. Let $k=3,7,11,23,31,71,211,331,2311$

From (2) and (3) we have

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

We prove that for $k=3,7,11,23,31,71,211,331,2311$

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

Example 2. Let $k \neq 3,7,11,23,31,71,211,331,2311$

From (2) and (3) we have

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

We prove that for $k \neq 3,7,11,23,31,71,211,331,2311$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1196)

$$p, jp^{2312}+k-j (j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2312}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2312}+k-j (j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2312}+k-j) \equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2312}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2312}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2312)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,137$

From (2) and (3) we have

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

We prove that for $k=3,5,137$

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

Example 2. Let $k\ne 3,5,137$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,137$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1197)

$$p, jp^{2314}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2314}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2314}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2314}+k-j)\equiv 0 \pmod p, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2314}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2314}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2314)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,179$

From (2) and (3) we have

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

We prove that for $k = 3,179$

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

Example 2. Let $k \neq 3,179$

From (2) and (3) we have

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

We prove that for $k \neq 3,179$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1198)

$$p, jp^{2316} + k - j (j = 1, 2, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2316} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2316} + k - j (j = 1, \cdots, k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2} [P - 1 - \chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1} (jq^{2316} + k - j) \equiv 0 \pmod{p}, q = 1, \cdots, p-1. \quad (3)$$

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 $jp^{2316} + k - j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P - 1$. Substituting it into (2) 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]

$$\pi_k(N, 2) = \left| \left\{ P \leq N : jp^{2316} + k - j = \text{prime} \right\} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2316)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0, 2) \geq 1$.

Example 1. Let $k = 3, 5, 7, 13, 773$

From (2) and (3) we have

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

We prove that for $k = 3, 5, 7, 13, 773$

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

Example 2. Let $k \neq 3, 5, 7, 13, 773$

From (2) and (3) we have

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

We prove that for $k \neq 3, 5, 7, 13, 773$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1199)

$$p, jp^{2318}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2318}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2318}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2318}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2318}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2318}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2318)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k\ne 3$

From (2) and (3) we have

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

We prove that for $k\ne 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1200)

$$p, jp^{2320}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2320}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2320}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2320}+k-j) \equiv 0 \pmod{p}, q = 1,\cdots,p-1. \quad (3)$$

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 $jp^{2320}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P-1$. Substituting it into (2) 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]

$$\pi_k(N,2) = \left|\{P \le N : jp^{2320}+k-j = \text{prime}\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2320)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2) \ge 1$.

Example 1. Let $k = 3,5,11,17,41,59,233$

From (2) and (3) we have

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

We prove that for $k = 3,5,11,17,41,59,233$

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

Example 2. Let $k \ne 3,5,11,17,41,59,233$

From (2) and (3) we have

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

We prove that for $k \ne 3,5,11,17,41,59,233$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1201)

$p, jp^{2322}+k-j (j = 1,2,\cdots,k-1)$

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Abstract

Using Jiang function we prove that $jp^{2322}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2322}+k-j (j = 1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2322}+k-j) \equiv 0 \pmod{p}, q = 1,\cdots,p-1. \quad (3)$$

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 $jp^{2322}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2322}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2322)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,7,19,173$

From (2) and (3) we have

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

We prove that for $k=3,7,19,173$

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

Example 2. Let $k\neq 3,7,19,173$

From (2) and (3) we have

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

We prove that for $k\neq 3,7,19,173$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1202)

$$p, jp^{2324}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2324}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2324}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2324}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2324}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2324}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2324)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N},\quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,29,1163$

From (2) and (3) we have

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

We prove that for $k=3,5,29,1163$

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

Example 2. Let $k\ne 3,5,29,1163$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,29,1163$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1203)

$$p, jp^{2326}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2326}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2326}+k-j(j=1,\cdots,k-1)\quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)].\quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2326}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1.\quad (3)$$

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 $jp^{2326}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2326}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2326)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N},\quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k \neq 3$

From (2) and (3) we have

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

We prove that for $k \neq 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1204)

$$p, jp^{2328}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2328}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2328}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2328}+k-j) \equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2328}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P \leq N: jp^{2328}+k-j=\text{prime}\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2328)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2) \geq 1$.

Example 1. Let $k=3,5,7,13,389$

From (2) and (3) we have

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

We prove that for $k=3,5,7,13,389$

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

Example 2. Let $k \neq 3,5,7,13,389$

From (2) and (3) we have

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

We prove that for $k \neq 3,5,7,13,389$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1205)

$$p, jp^{2330}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2330}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2330}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2330}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2330}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2330}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2330)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,11,467$

From (2) and (3) we have

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

We prove that for $k=3,11,467$

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

Example 2. Let $k\ne 3,11,467$

From (2) and (3) we have

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

We prove that for $k\ne 3,11,467$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1206)

$p, jp^{2332}+k-j(j=1,2,\cdots,k-1)$

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Abstract

Using Jiang function we prove that $jp^{2332}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2332}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)].\qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2332}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1.\qquad (3)$$

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 $jp^{2332}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2332}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2332)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N},\qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,23,107,2333$

From (2) and (3) we have

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

We prove that for $k=3,5,23,107,2333$

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

Example 2. Let $k\ne 3,5,23,107,2333$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,23,107,2333$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1207)

$$p, jp^{2334}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2334}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2334}+k-j(j=1,\cdots,k-1)\qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)].\qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2334}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1.\qquad (3)$$

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 $jp^{2334}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2334}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2334)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 (1208)

$$p, jp^{2336}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2336}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2336}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2336}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2336}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2336}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2336)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,17,293$

From (2) and (3) we have

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

We prove that for $k=3,5,17,293$

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

Example 2. Let $k\ne 3,5,17,293$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,17,293$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1209)

$$p, jp^{2338}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2338}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2338}+k-j(j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2338}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2338}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2338}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2338)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,2339$

From (2) and (3) we have

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

We prove that for $k=3,2339$

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

Example 2. Let $k \neq 3, 2339$

From (2) and (3) we have

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

We prove that for $k \neq 3, 2339$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1210)

$$p, jp^{2340} + k - j(j = 1, 2, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2340} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2340} + k - j(j = 1, \cdots, k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2}[P - 1 - \chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2340} + k - j) \equiv 0 \pmod{p}, q = 1, \cdots, p-1. \quad (3)$$

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 $jp^{2340} + k - j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P - 1$. Substituting it into (2) 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]

$$\pi_k(N, 2) = \left|\{P \leq N : jp^{2340} + k - j = \text{prime}\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2340)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0, 2) \geq 1$.

Example 1. Let $k = 3, 5, 7, 11, 19, 31, 53, 61, 79, 131, 181, 1171, 2341$

From (2) and (3) we have

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

We prove that for $k = 3, 5, 7, 11, 19, 31, 53, 61, 79, 131, 181, 1171, 2341$

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

Example 2. Let $k \neq 3, 5, 7, 11, 19, 31, 53, 61, 79, 131, 181, 1171, 2341$

From (2) and (3) we have

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

We prove that for $k \neq 3, 5, 7, 11, 19, 31, 53, 61, 79, 131, 181, 1171, 2341$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1211)

$$p, jp^{2342} + k - j(j = 1, 2, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2342}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2342}+k-j(j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2342}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2342}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2342}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2342)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k\ne 3$

From (2) and (3) we have

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

We prove that for $k\ne 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1212)

$$p, jp^{2344}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2344}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2344}+k-j(j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2344}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2344}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2344}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2344)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,587$

From (2) and (3) we have

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

We prove that for $k=3,5,587$

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

Example 2. Let $k\ne 3,5,587$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,587$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1213)

$$p, jp^{2346}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2346}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2346}+k-j(j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2346}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2346}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2346}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2346)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,7,47,103,139,2347$

From (2) and (3) we have

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

We prove that for $k=3,7,47,103,139,2347$

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

Example 2. Let $k\neq 3,7,47,103,139,2347$

From (2) and (3) we have

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

We prove that for $k\neq 3,7,47,103,139,2347$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1214)

$$p, jp^{2348}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2348}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2348}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2348}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2348}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2348}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2348)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k\ne 3,5$

From (2) and (3) we have

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

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

(1) contain infinitely many prime solutions.

The New Prime Theorem (1215)

$$p, jp^{2350}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2350}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2350}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2350}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2350}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2350}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2350)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,11,2351$

From (2) and (3) we have

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

We prove that for $k=3,11,2351$

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

Example 2. Let $k\ne 3,11,2351$.

From (2) and (3) we have

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

We prove that for $k \neq 3,11,2351$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1216)

$$p, jp^{2352} + k - j (j = 1, 2, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2352} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2352} + k - j (j = 1, \cdots, k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2} [P - 1 - \chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1} (jq^{2352} + k - j) \equiv 0 \pmod{p}, q = 1, \cdots, p-1. \quad (3)$$

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 $jp^{2352} + k - j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P - 1$. Substituting it into (2) 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]

$$\pi_k(N, 2) = \left| \{ P \leq N : jp^{2352} + k - j = \text{prime} \} \right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2352)^{k-1} \phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0, 2) \geq 1$.

Example 1. Let $k = 3,5,7,13,29,43,197,337$

From (2) and (3) we have

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

We prove that for $k = 3,5,7,13,29,43,197,337$

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

Example 2. Let $k \neq 3,5,7,13,29,43,197,337$

From (2) and (3) we have

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

We prove that for $k \neq 3,5,7,13,29,43,197,337$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1217)

$$p, jp^{2354} + k - j (j = 1, 2, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2354}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2354}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2354}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2354}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2354}+k-j=\text{prime}\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2354)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,23$

From (2) and (3) we have

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

We prove that for $k=3,23$

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

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

From (2) and (3) we have

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

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

(1) contain infinitely many prime solutions.

The New Prime Theorem (1218)

$p, jp^{2356}+k-j(j=1,2,\cdots,k-1)$

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Abstract

Using Jiang function we prove that $jp^{2356}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2356}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2356}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2356}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2356}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2356)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,2357$

From (2) and (3) we have

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

We prove that for $k=3,5,2357$

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

Example 2. Let $k\ne 3,5,2357$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,2357$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1219)

$$p, jp^{2358}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2358}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2358}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2358}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2358}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2358}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2358)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,7,19,263,787$

From (2) and (3) we have

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

We prove that for $k=3,7,19,263,787$

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

Example 2. Let $k\neq 3,7,19,263,787$

From (2) and (3) we have

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

We prove that for $k\neq 3,7,19,263,787$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1220)

$$p, jp^{2360}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2360}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2360}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2360}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2360}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2360}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2360)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k = 3,5,11,41$

From (2) and (3) we have

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

We prove that for $k = 3,5,11,41$

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

Example 2. Let $k \neq 3,5,11,41$

From (2) and (3) we have

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

We prove that for $k \neq 3,5,11,41$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1221)

$$p, jp^{2362} + k - j (j = 1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2362} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2362} + k - j (j = 1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2}[P - 1 - \chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2362} + k - j) \equiv 0 \pmod{p}, q = 1,\cdots,p-1. \quad (3)$$

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 $jp^{2362} + k - j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P - 1$. Substituting it into (2) 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]

$$\pi_k(N,2) = \left|\left\{P \leq N : jp^{2362} + k - j = \text{prime}\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2362)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2) \geq 1$.

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 $k \neq 3$

From (2) and (3) we have

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

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

The New Prime Theorem (1222)

$$p, jp^{2364}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2364}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2364}+k-j(j=1,\cdots,k-1) \quad (1)$$

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

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2364}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2364}+k-j$ is a prime.
Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\leq N: jp^{2364}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2364)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\geq 1$.

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

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

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

Example 2. Let $k\neq 3,5,7$
From (2) and (3) we have

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

We prove that for $k\neq 3,5,7$
(1) contain infinitely many prime solutions.

The New Prime Theorem (1223)

$$p, jp^{2366}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2366}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2366}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2366}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2366}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2366}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2366)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

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 $k\ne 3$

From (2) and (3) we have

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

We prove that for $k\ne 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1224)

$$p, jp^{2368}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2368}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2368}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2368}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2368}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P \le N : jp^{2368}+k-j=\text{prime}\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2368)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2) \ge 1$.

Example 1. Let $k=3,5,17,149,563$

From (2) and (3) we have

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

We prove that for $k=3,5,17,149,563$

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

Example 2. Let $k \ne 3,5,17,149,563$

From (2) and (3) we have

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

We prove that for $k \ne 3,5,17,149,563$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1225)

$$p, jp^{2370}+k-j (j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2370}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2370}+k-j (j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2370}+k-j) \equiv 0 \pmod p, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2370}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2370}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2370)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N},\qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,7,11,31,2371$

From (2) and (3) we have

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

We prove that for $k=3,7,11,31,2371$

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

Example 2. Let $k\neq 3,7,11,31,2371$

From (2) and (3) we have

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

We prove that for $k\neq 3,7,11,31,2371$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1226)

$$p, jp^{2372}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2372}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2372}+k-j(j=1,\cdots,k-1)\qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)].\qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2372}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1.\qquad (3)$$

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 $jp^{2372}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2372}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2372)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N},\qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,1187$

From (2) and (3) we have

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

We prove that for $k=3,5,1187$

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

Example 2. Let $k\neq 3,5,1187$

From (2) and (3) we have

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

We prove that for $k\neq 3,5,1187$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1227)

$$p, jp^{2374}+k-j (j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2374}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2374}+k-j (j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2374}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2374}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\leq N: jp^{2374}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2374)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\geq 1$.

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 $k\neq 3$

From (2) and (3) we have

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

We prove that for $k\neq 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1228)

$$p, jp^{2376}+k-j(j=1,2,\cdots,k-1)$$

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Abstract
Using Jiang function we prove that $jp^{2376}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2376}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2376}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2376}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2376}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2376)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,7,13,19,23,37,67,73,89,109,199,397,2377$

From (2) and (3) we have

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

We prove that for $k=3,5,7,13,19,23,37,67,73,89,109,199,397,2377$

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

Example 2. Let $k\ne 3,5,7,13,19,23,37,67,73,89,109,199,397,2377$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,7,13,19,23,37,67,73,89,109,199,397,2377$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1229)

$$p, jp^{2378}+k-j(j=1,2,\cdots,k-1)$$

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Abstract
Using Jiang function we prove that $jp^{2378}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2378}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2378}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2378}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2378}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2378)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,59,83$

From (2) and (3) we have

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

We prove that for $k=3,59,83$

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

Example 2. Let $k\ne 3,59,83$

From (2) and (3) we have

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

We prove that for $k\ne 3,59,83$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1230)

$$p, jp^{2380}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2380}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2380}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2380}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2380}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\leq N: jp^{2380}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2380)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\geq 1$.

Example 1. Let $k=3,5,11,29,71,239,2381$

From (2) and (3) we have

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

We prove that for $k=3,5,11,29,71,239,2381$

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

Example 2. Let $k\neq 3,5,11,29,71,239,2381$

From (2) and (3) we have

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

We prove that for $k\neq 3,5,11,29,71,239,2381$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1231)

$$p, jp^{2382}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2382}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2382}+k-j(j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2382}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2382}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2382}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2382)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,7,2383$

From (2) and (3) we have

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

We prove that for $k=3,7,2383$

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

Example 2. Let $k\ne 3,7,2383$

From (2) and (3) we have

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

We prove that for $k\ne 3,7,2383$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1232)

$$p, jp^{2384}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2384}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2384}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2384}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2384}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2384}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2384)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,17,1193$

From (2) and (3) we have

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

We prove that for $k = 3,5,17,1193$

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

Example 2. Let $k \neq 3,5,17,1193$

From (2) and (3) we have

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

We prove that for $k \neq 3,5,17,1193$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1233)

$$p, jp^{2386} + k - j (j = 1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2386} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2386} + k - j (j = 1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2}[P - 1 - \chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2386} + k - j) \equiv 0 \pmod{p}, q = 1,\cdots,p-1. \quad (3)$$

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 $jp^{2386} + k - j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P - 1$. Substituting it into (2) 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]

$$\pi_k(N,2) = \left|\left\{P \leq N : jp^{2386} + k - j = \text{prime}\right\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2386)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2) \geq 1$.

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 $k \neq 3$

From (2) and (3) we have

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

We prove that for $k \neq 3$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1234)

$$p, jp^{2388} + k - j (j = 1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2388}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2388}+k-j (j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2388}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2388}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2388}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2388)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,7,13,2389$

From (2) and (3) we have

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

We prove that for $k=3,5,7,13,2389$

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

Example 2. Let $k\ne 3,5,7,13,2389$

From (2) and (3) we have

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

We prove that for $k\ne 3,5,7,13,2389$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1235)

$p, jp^{2390}+k-j (j=1,2,\cdots,k-1)$

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Abstract

Using Jiang function we prove that $jp^{2390}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2390}+k-j (j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2390}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2390}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2390}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2390)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,11,479$

From (2) and (3) we have

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

We prove that for $k=3,11,479$

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

Example 2. Let $k\ne 3,11,479$

From (2) and (3) we have

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

We prove that for $k\ne 3,11,479$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1236)

$$p, jp^{2392}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2392}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2392}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2392}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2392}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2392}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2392)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,47,53,599,2393$

From (2) and (3) we have

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

We prove that for $k=3,5,47,53,599,2393$

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

Example 2. Let $k\neq 3,5,47,53,599,2393$

From (2) and (3) we have

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

We prove that for $k\neq 3,5,47,53,599,2393$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1237)

$$p, jp^{2394}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2394}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2394}+k-j(j=1,\cdots,k-1) \qquad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \qquad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2394}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \qquad (3)$$

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 $jp^{2394}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\left\{P\le N: jp^{2394}+k-j=\text{prime}\right\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2394)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \qquad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\geq 1$.

Example 1. Let $k=3,7,19,43,127$

From (2) and (3) we have

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

We prove that for $k=3,7,19,43,127$

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

Example 2. Let $k\neq 3,7,19,43,127$

From (2) and (3) we have

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

We prove that for $k\neq 3,7,19,43,127$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1238)

$$p, jp^{2396}+k-j(j=1,2,\cdots,k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2396}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2396}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2396}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2396}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\leq N: jp^{2396}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2396)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\geq 1$.

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 $k \neq 3,5$

From (2) and (3) we have

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

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

(1) contain infinitely many prime solutions.

The New Prime Theorem (1239)

$$p, jp^{2398} + k - j (j = 1, 2, \cdots, k-1)$$

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Abstract

Using Jiang function we prove that $jp^{2398} + k - j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2398} + k - j (j = 1, \cdots, k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega) = \prod_{P>2}[P - 1 - \chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2398} + k - j) \equiv 0 \pmod{p}, q = 1, \cdots, p-1. \quad (3)$$

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 $jp^{2398} + k - j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P) = P - 1$. Substituting it into (2) 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]

$$\pi_k(N,2) = \left|\{P \leq N : jp^{2398} + k - j = \text{prime}\}\right| \sim \frac{J_2(\omega)\omega^{k-1}}{(2398)^{k-1}\phi^k(\omega)} \frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0, 2) \geq 1$.

Example 1. Let $k = 3, 23, 2399$

From (2) and (3) we have

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

We prove that for $k = 3, 23, 2399$

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

Example 2. Let $k \neq 3, 23, 2399$

From (2) and (3) we have

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

We prove that for $k \neq 3, 23, 2399$

(1) contain infinitely many prime solutions.

The New Prime Theorem (1240)

$$p, jp^{2400} + k - j (j = 1, 2, \cdots, k-1)$$

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Abstract
Using Jiang function we prove that $jp^{2400}+k-j$ contain infinitely many prime solutions and no prime solutions.

Theorem. Let k be a given odd prime.

$$p, jp^{2400}+k-j(j=1,\cdots,k-1) \quad (1)$$

Contain infinitely many prime solutions and no prime solutions.

Proof. We have Jiang function [1,2]

$$J_2(\omega)=\prod_{P>2}[P-1-\chi(P)]. \quad (2)$$

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

$$\prod_{j=1}^{k-1}(jq^{2400}+k-j)\equiv 0 \pmod{p}, q=1,\cdots,p-1. \quad (3)$$

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 $jp^{2400}+k-j$ is a prime.

Using Fermat's little theorem from (3) we have $\chi(P)=P-1$. Substituting it into (2) 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]

$$\pi_k(N,2)=\left|\{P\le N: jp^{2400}+k-j=\text{prime}\}\right|\sim\frac{J_2(\omega)\omega^{k-1}}{(2400)^{k-1}\phi^k(\omega)}\frac{N}{\log^k N}, \quad (6)$$

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

From (6) we are able to find the smallest solution $\pi_k(N_0,2)\ge 1$.

Example 1. Let $k=3,5,7,11,13,17,31,41,61,97,101,151,241,401,601$

From (2) and (3) we have

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

We prove that for $k=3,5,7,11,13,17,31,41,61,97,101,151,241,401,601$

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

Example 2. Let $k\neq 3,5,7,11,13,17,31,41,61,97,101,151,241,401,601$

From (2) and (3) we have

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

We prove that for $k\neq 3,5,7,11,13,17,31,41,61,97,101,151,241,401,601$

(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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Szemerédi's theorem does not directly to the primes, because it cannot count the number of primes. Cramér's random model cannot prove any prime problems. The probability of $1/\log N$ of being prime is false. Assuming that the events "P is prime", "$P+2$ is prime" and "$P+4$ is prime" are independent, we conclude that P, $P+2$, $P+4$ are simultaneously prime with probability about $1/\log^3 N$. There are about $N/\log^3 N$ primes less than N. Letting $N\to\infty$ we obtain the prime conjecture, which is false. The tool of additive prime number theory is basically the Hardy-Littlewood prime tuples conjecture, but cannot prove and count any prime problems[6].

Mathematicians have tried in vain to discover some order in the sequence of prime numbers but we have every reason to believe that there are some mysteries which the human mind will never penetrate. Leonhard Euler(1707-1783). *It will be another million years, at least, before we understand the primes.* Paul Erdos(1913-1996).

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