Theorem of prime pairs

$$(A_1, B_1), (A_2, B_2), \cdots, (A_n, B_n)$$

$$A_n = a_1 n + a_2$$

$$B_n = b_1 n + b_2$$

A_n, B_n are not an obviously composite

<Theorem1>

For constant c,

If $c \cdot P ln^3 P < n$, $\forall A_n, B_n < P^2$

$(A_1, B_1), (A_2, B_2), \cdots, (A_n, B_n)$ contains

(A_k, B_k) that both are prime

<proof1>

$$(A_1, B_1), (A_2, B_2), \cdots, (A_n, B_n)$$

Consecutive p pair has at most 2 pairs that has factor p.

Length of $3, 3, 5, 5, 7, 7, \cdots, P, P = \frac{2P}{lnP}$

And consecutive.

If consecutive 3 pairs contains two pairs that has factor 3,

$$3, 3, 5,3,3, 5,3,3, 7,3,3\ 7, \cdots, P, 3,3, P, 3,3$$

Not longer than $\frac{2P}{lnP} \cdot \frac{3+2}{3-2}$

for p, also not longer than $\frac{2P}{lnP} \cdot \frac{p+2}{p-2}$

From that $p < \frac{2P}{lnP} \cdot \frac{3+2}{3-2} \cdot \frac{5+2}{5-2} \cdot \cdots \cdot \frac{p+2}{p-2}$

If consecutive p pair has at most 2 pairs that has factor p, it's not longer than

$$\frac{2P}{lnP} \cdot \frac{3+2}{3-2} \cdot \frac{5+2}{5-2} \cdot \cdots \cdot \frac{p+2}{p-2}$$

From that $\frac{p+2}{p-2} < \left(\frac{p}{p-1}\right)^4$, $\frac{3-1}{3} \cdot \frac{5-1}{5} \cdot \cdots \cdot \frac{p-1}{p} = \frac{c_1}{lnp}$

We know that $\frac{2p}{lnp} \cdot \frac{3+2}{3-2} \cdot \frac{5+2}{5-2} \cdot \cdots \cdot \frac{p+2}{p-2} < c \cdot P \cdot ln^3 P$

And

If $c \cdot Pln^3 P < n$, $\forall A_n, B_n < P^2$

$(A_1, B_1), (A_2, B_2), \cdots, (A_n, B_n)$ contains

(A_k, B_k) both are prime

<Theorem2>

If $\mathrm{c} \cdot Pln^{2k-1} P < n$, $\forall A_k, B_k, C_k, \cdots < P^2$

$(A_1, B_1, C_1, \cdots), (A_2, B_2, C_2 \cdots), \cdots, (A_n, B_n, C_n \cdots)$

Contains

$(A_k, B_k, C_k, \cdots)$that $A_k, B_k, C_k, \cdots$ are prime at once

<proof2>

Likewise <proof1>

We can solve

1.Goldbach's conjecture

$$A_n = 2n + 1$$

$$B_n = 2N - 2n - 1$$

$c \cdot \sqrt{2N}(ln\sqrt{2N})^3 < N - 1$

2.Twin prime conjecture

$$A_n = 2n + 1$$

$$B_n = 2n - 1$$

Between $2N$ and $2N - c \cdot \sqrt{2N} \cdot (ln\sqrt{2N})^3$

There is (A_k, B_k) that both are prime.