

A Result of Even & Prime

Shan Wang
892681362@qq.com

A Result of Even & Prime
ABSTRACT

Objective:

$$H(a)=Z(a)/Y(a)$$

Method:

$$(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha)>(a/4-a/\ln(a)-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*((a/2-1)/2-(a/2-1)/\ln(a/2-1)+1)/2+((a/2-2)/2-(a/2-2)/\ln(a/2-2))*((a/2-2)/2-(a/2-2)/\ln(a/2-2)+1)/2)/(((a/2)/2-(a/2)/\ln(a/2))*(((a-1)/2-(a-1)/\ln(a-1))-((a/2-1)/2-(a/2-1)/\ln(a/2-1)))-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*(((a-3)/2-(a-3)/\ln(a-3))-((a/2-2)/2-(a/2-2)/\ln(a/2-2))))).$$

$$(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha)>(a/4-a/\ln(a)+1-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*((a/2-1)/2-(a/2-1)/\ln(a/2-1)+1)/2+((a/2-2)/2-(a/2-2)/\ln(a/2-2))*((a/2-2)/2-(a/2-2)/\ln(a/2-2)+1)/2)/(((a/2)/2-(a/2)/\ln(a/2))*(((a-1)/2-(a-1)/\ln(a-1))-((a/2-1)/2-(a/2-1)/\ln(a/2-1)))-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*(((a-3)/2-(a-3)/\ln(a-3))-((a/2-2)/2-(a/2-2)/\ln(a/2-2))))$$

Result:

The number of prime pair an even a can be written as is denoted as T(a),

$$T(a)\sim(((a/2)/2-(a/2)/\ln(a/2))*(((a-1)/2-(a-1)/\ln(a-1))-((a/2-1)/2-(a/2-1)/\ln(a/2-1)))-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*(((a-3)/2-(a-3)/\ln(a-3))-((a/2-2)/2-(a/2-2)/\ln(a/2-2))))*((a/4)/2-(a/4)/\ln(a/4))*(((3*a/4)/2-(3*a/4)/\ln(3*a/4))-((a/2)/2-(a/2)/\ln(a/2)))/(((a/4)/2-(a/4)/\ln(a/4))*(((3*a/4)/2-(3*a/4)/\ln(3*a/4))-((a/2)/2-(a/2)/\ln(a/2))))+(((a/2)/2-(a/2)/\ln(a/2))-((a/4)/2-(a/4)/\ln(a/4))*((a/2-a/\ln(a))-((3*a/4)/2-(3*a/4)/\ln(3*a/4))))+((a/2-1)/2-(a/2-1)/\ln(a/2-1))*((a/2-1)/2-(a/2-1)/\ln(a/2-1)+1)/2-((a/2-2)/2-(a/2-2)/\ln(a/2-2))*((a/2-2)/2-(a/2-2)/\ln(a/2-2)+1)/2+a/\ln(a)-a/4.$$

Conclusions:

If { 1 is also a prime number } is true, then any even number greater than 0 can be written as the sum of two prime numbers.

If { 1 is also a prime number } is false, then any even number greater than 4 can be written as the sum of two prime numbers.

Key words: Goldbach; Euler; even; prime.

1 Structure

1.1 Concept

Set of natural numbers is denoted as N , $N = \{n\}$.

If one variable belongs to N , then it is denoted as n .

If two variables belong to N , then they are denoted as n_1 and n_2 .

Set of even numbers is denoted as A , $A = \{a | a = 2 * n\}$.

If one variable belongs to A , then it is denoted as a .

If two variables belong to A , then they are denoted as a_1 and a_2 .

Set of odd numbers is denoted as B , $B = \{b | b = 2 * n + 1\}$.

If one variable belongs to B , then it is denoted as b .

If two variables belong to B , then they are denoted as b_1 and b_2 .

Set of odd composite numbers is denoted as C

$C = \{c | c = (2 * n_1 + 1) * (2 * n_2 + 1), n_1 \text{ is not } 0 \text{ and } n_2 \text{ is not } 0.\}$

If one variable belongs to C , then it is denoted as c .

If two variables belong to C , then they are denoted as c_1 and c_2 .

Set of prime numbers is denoted as D

If $\{1 \text{ is also a prime number}\}$ is true,

then $D = \{d | d \text{ belongs to } B \text{ and } d \text{ does not belong to } C\}$

If $\{1 \text{ is also a prime number}\}$ is false,

then $D = \{d | d \text{ belongs to } B \text{ and } d \text{ does not belong to } C, d \text{ is not } 1.\}$

If one variable belongs to D , then it is denoted as d .

If two variables belong to D , then they are denoted as d_1 and d_2 .

1.2 $N(a)$

$a = a/2 + a/2, a > 0$.

If $a/2$ belongs to A , then set $a = [(a/2 - 1) - 2n] + [(a/2 + 1) + 2n]$.

$n < (a - 2)/4, \text{Card}(n) = a/4$.

$(a/2 + 1) - 2n$ is denoted as bL , $(a/2 + 1) + 2n$ is denoted as bR .

If $a/2$ belongs to B , then set $a = (a/2 - 2n) + (a/2 + 2n)$.

$n < a/4, \text{Card}(n) = (a + 2)/4$.

$a/2 - 2n$ is denoted as bL , $a/2 + 2n$ is denoted as bR .

$bL = (a/2 + 1) - 2n$, $a/2$ belongs to A ; $bL = a/2 - 2n$, $a/2$ belongs to B .

$bR = (a/2 + 1) + 2n$, $a/2$ belongs to A ; $bR = a/2 + 2n$, $a/2$ belongs to B .

$\text{Card}(n)$ is denoted as $N(a)$; $N(a) = a/4$, $a/2$ belongs to A ; $N(a) = (a + 2)/4$, $a/2$ belongs to B .

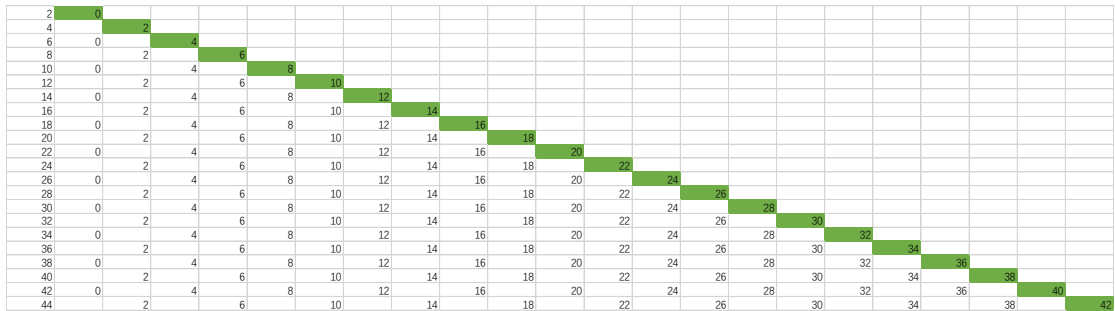
$N(a) \sim a/4, a > a_0$. Error is denoted as $O(a)$, $O(a) \sim 0$ when $a > a_0$.

1.3 $e = bR - bL$

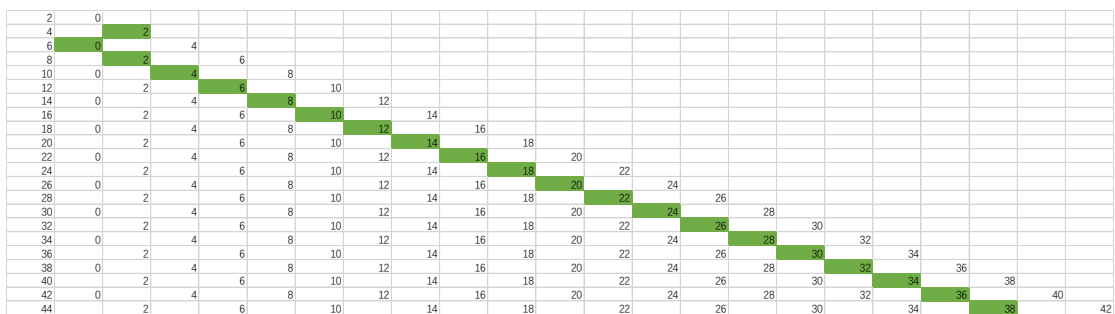
Set one increasing positive even sequence, it corresponds to $\{a | a > 0\}$.

e is one function of a when g is invariable, any odd composite number in (0, a) corresponds to one cell in {L=a}. Equation is $e=|(a-g)-g|$, $a>g$.

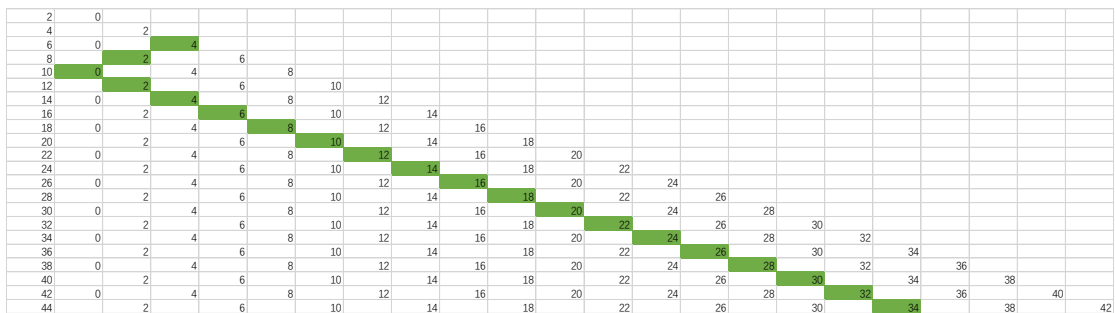
$e=|(a-1)-1|$, $a>1$.



$e=|(a-3)-3|$, $a>3$.



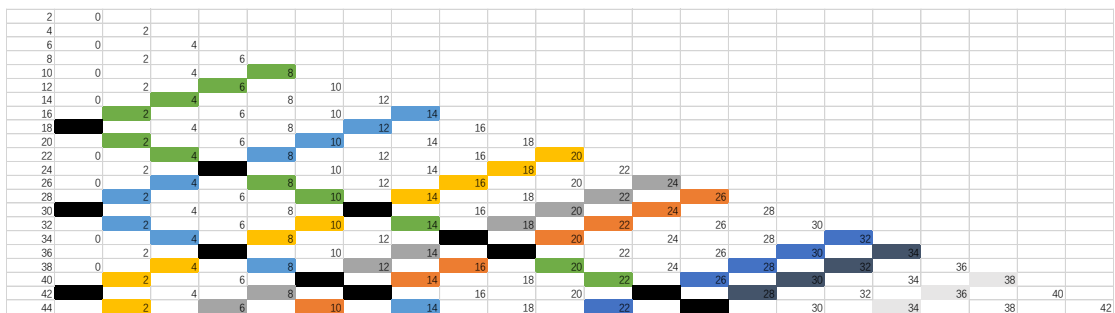
$e=|(a-5)-5|$, $a>5$.



...

1.5 $U(a)-T(a)=S(a)-N(a)$

If bL or bR belongs to C, then color the cell.



If bL and bR belong to C, then color it black.

The number of prime numbers in $(0, a]$ is denoted as $I(a)$, $I(a) \sim a/\ln(a)$.

The number of odd composite numbers in $(0, a]$ is denoted as $S(a)$, $S(a) \sim a/2 - a/\ln(a)$.

The number of black cells in $\{L=a\}$ is denoted as $U(a)$, the number of colored non black cells in $\{L=a\}$ is denoted as $V(a)$.

The number of colorless cells in $\{L=a\}$ is denoted as $T(a)$

$$V(a) + T(a) + U(a) = N(a), \quad V(a) = S(a) - 2 * U(a).$$

1.6 Algebra

If $\{1 \text{ is also a prime number}\}$ is true, then any even number greater than 0 can be written as the sum of two prime numbers.

Objective is denoted as $\{\text{Any } T(a) > 0, a > 0.\}$

If $\{1 \text{ is also a prime number}\}$ is false, then any even number greater than 4 can be written as the sum of two prime numbers.

Objective is denoted as $\{\text{Any } T(a) > 1, a > 4.\}$

2 Prove

$W = \{(bL, bR) | bL \text{ belongs to } (0, a/2], bR \text{ belongs to } [a/2, a).\}$

Card(bL, bR) is denoted as $W(a)$, $W(a) = N(a)^2$.

2	0												
4		2											
6	0		4										
8		2		6									
10	0		4		8								
12		2		6		10							
14	0		4		8		12						
16		2		6		10		14					
18	0		4		8		12		16				
20		2		6		10		14		18			
22	0		4		8		12		16		20		
24		2		6		10		14		18			
26	0		4		8		12		16			20	
28		2		6		10		14		18			
30	0		4		8		12		16			20	
32		2		6		10		14		18			

2	0												
4		2											
6	0		4										
8		2		6									
10	0		4		8								
12		2		6		10							
14	0		4		8		12						
16		2		6		10		14					
18	0		4		8		12		16				
20		2		6		10		14		18			
22	0		4		8		12		16		20		
24		2		6		10		14		18		22	
26	0		4		8		12		16		20		
28		2		6		10		14		18			22
30	0		4		8		12		16			20	
32		2		6		10		14		18			22
34	0		4		8		12		16			20	

If b_L and b_R belong to C , then the cell is denoted as (c_L, c_R) .

$X = \{(c_L, c_R) | c_L \text{ and } c_R \text{ belong to } (0, a/2-1]\}$;

$\text{Card}(c_L, c_R)$ is denoted as $X(a)$, $X(a) = S(a/2-1) * (S(a/2-1)+1)/2$.

$Y = \{(c_L, c_R) | c_L \text{ belongs to } (0, a/2] \text{ and } c_R \text{ belongs to } [a/2, a-1]\}$;

$\text{Card}(c_L, c_R)$ is denoted as $Y(a)$, $Y(a) = S(a/2) * (S(a-1) - S(a/2-1))$.

If b_L and b_R belong to Y , then the cell is denoted as (y_L, y_R) .

$Z = \{(y_L, y_R) | y_L + y_R \text{ belongs to } (0, a]\}$;

$\text{Card}(y_L, y_R)$ is denoted as $Z(a)$, $Z(a) = H(a) * Y(a)$.

2.1 $H(a) \sim H(a-2)$

Maximum error is denoted as $Or(a)$, $Or(a) \sim 0$ when $a > a_0$.

$M = \{(c_L, c_R) | c_L + c_R \text{ belongs to } (0, a]\}$, $\text{Card}(c_L, c_R)$ is denoted as $M(a)$.

$M(a) = X(a) + Y(a)$, $U(a) = M(a) - M(a-2)$.

Let $T(a) = 0$, $U(a) = S(a) - N(a)$.

$H(a) \sim (S(a) - N(a) - X(a) + X(a-2)) / (Y(a) - Y(a-2))$

$H(a) \sim (a/4 - a/\ln(a) - ((a/2-1)/2 - (a/2-1)/\ln(a/2-1)) * ((a/2-1)/2 - (a/2-1)/\ln(a/2-1) + 1)/2 + ((a/2-2)/2 - (a/2-2)/\ln(a/2-2)) * ((a/2-2)/2 - (a/2-2)/\ln(a/2-2) + 1)/2 / (((a/2)/2 - (a/2)/\ln(a/2)) * (((a-1)/2 - (a-1)/\ln(a-1)) - ((a/2-1)/2 - (a/2-1)/\ln(a/2-1))) - ((a/2-1)/2 - (a/2-1)/\ln(a/2-1)) * (((a-3)/2 - (a-3)/\ln(a-3)) - ((a/2-2)/2 - (a/2-2)/\ln(a/2-2)))$

Let $T(a) = 1$, $U(a) = S(a) - N(a) + 1$.

$H(a) \sim (S(a) - N(a) + 1 - X(a) + X(a-2)) / (Y(a) - Y(a-2))$

$H(a) \sim (a/4 - a/\ln(a) + 1 - ((a/2-1)/2 - (a/2-1)/\ln(a/2-1)) * ((a/2-1)/2 - (a/2-1)/\ln(a/2-1) + 1)/2 + ((a/2-2)/2 - (a/2-2)/\ln(a/2-2)) * ((a/2-2)/2 - (a/2-2)/\ln(a/2-2) + 1)/2 / (((a/2)/2 - (a/2)/\ln(a/2)) * (((a-1)/2 - (a-1)/\ln(a-1)) - ((a/2-1)/2 - (a/2-1)/\ln(a/2-1))) - ((a/2-1)/2 - (a/2-1)/\ln(a/2-1)) * (((a-3)/2 - (a-3)/\ln(a-3)) - ((a/2-2)/2 - (a/2-2)/\ln(a/2-2)))$

2.2 $H(a) \sim J(a)/(J(a)+K(a))$, $a > 0$.

Maximum error is denoted as $O_0(a)$, $O_0(a) \sim (W(a) - (J(a) + K(a))) / W(a) \sim 1/2$.

$J = \{(c_L, c_R) | c_L \text{ belongs to } (0, a/4] \text{ and } c_R \text{ belongs to } (a/2, 3*a/4]\}$;

$\text{Card}(c_L, c_R)$ is denoted as $J(a)$, $J(a) = S(a/4) * (S(3*a/4) - S(a/2))$.

$K = \{(c_L, c_R) | c_L \text{ belongs to } (a/4, a/2] \text{ and } c_R \text{ belongs to } (3*a/4, a]\}$;

$\text{Card}(c_L, c_R)$ is denoted as $K(a)$, $K(a) = (S(a/2) - S(a/4)) * (S(a) - S(3*a/4))$.

$J(a)/(J(a)+K(a)) \sim (((a/4)/2 - (a/4)/\ln(a/4)) * (((3*a/4)/2 - (3*a/4)/\ln(3*a/4)) - ((a/2)/2 - (a/2)/\ln(a/2))) / (((a/4)/2 - (a/4)/\ln(a/4)) * (((3*a/4)/2 - (3*a/4)/\ln(3*a/4)) - ((a/2)/2 - (a/2)/\ln(a/2))) + (((a/2)/2 - (a/2)/\ln(a/2)) - ((a/4)/2 - (a/4)/\ln(a/4))) * ((a/2 - a/\ln(a)) - ((3*a/4)/2 - (3*a/4)/\ln(3*a/4)))$

2.2.1 $H(a) \sim (J(a) + p_1 + p_2) / (J(a) + K(a) + p_1 + p_2 + q_1 + q_2)$, $a > 8$.

Maximum error is denoted as $O_2(a)$, $O_2(a) \sim 1/4$.

$P_1 = \{(c_L, c_R) | c_L \text{ belongs to } (0, a/8] \text{ and } c_R \text{ belongs to } (3*a/4, 7*a/8]\}$;

$\text{Card}(c_L, c_R)$ is denoted as p_1 , $p_1 = S(a/8) * (S(7*a/8) - S(3*a/4))$.

$P_2 = \{(c_L, c_R) | c_L \text{ belongs to } (a/4, 3*a/8] \text{ and } c_R \text{ belongs to } (a/2, 5*a/8]\}$;

Card(cL, cR) is denoted as p2, $p2=(S(3*a/8)-S(a/4))*(S(5*a/8)-S(a/2))$.

$Q1=\{(cL, cR)|cL \text{ belongs to } (a/8, a/4] \text{ and } cR \text{ belongs to } (7*a/8, a]\}$;

Card(cL, cR) is denoted as q1, $q1=(S(a/4)-S(a/8))*(S(a)-S(7*a/8))$.

$Q2=\{(cL, cR)|cL \text{ belongs to } (3*a/8, a/2] \text{ and } cR \text{ belongs to } (5*a/8, 3*a/4]\}$;

Card(cL, cR) is denoted as q2, $q2=(S(a/2)-S(3*a/8))*(S(3*a/4)-S(5*a/8))$.

2.2.2 $H(a)\sim(J(a)+p1+\dots+p6)/(J(a)+K(a)+p1+\dots+p6+q1+\dots+q6)$, $a>24$.

Maximum error is denoted as $O6(a)$, $O6(a)\sim 1/8$.

$P3=\{(cL, cR)|cL \text{ belongs to } (0, a/16] \text{ and } cR \text{ belongs to } (7*a/8, 15*a/16]\}$;

Card(cL, cR) is denoted as p3, $p3=S(a/16)*(S(15*a/16)-S(7*a/8))$.

$P4=\{(cL, cR)|cL \text{ belongs to } (a/8, 3*a/16] \text{ and } cR \text{ belongs to } (3*a/4, 13*a/16]\}$;

Card(cL, cR) is denoted as p4, $p4=(S(3*a/16)-S(a/8))*(S(13*a/16)-S(3*a/4))$.

$P5=\{(cL, cR)|cL \text{ belongs to } (a/4, 5*a/16] \text{ and } cR \text{ belongs to } (5*a/8, 11*a/16]\}$;

Card(cL, cR) is denoted as p5, $p5=(S(5*a/16)-S(a/4))*(S(11*a/16)-S(5*a/8))$.

$P6=\{(cL, cR)|cL \text{ belongs to } (3*a/8, 7*a/16] \text{ and } cR \text{ belongs to } (a/2, 9*a/16]\}$;

Card(cL, cR) is denoted as p6, $p6=(S(7*a/16)-S(3*a/8))*(S(9*a/16)-S(a/2))$.

$Q3=\{(cL, cR)|cL \text{ belongs to } (a/16, a/8] \text{ and } cR \text{ belongs to } (15*a/16, a]\}$;

Card(cL, cR) is denoted as q3, $q3=(S(a/8)-S(a/16))*(S(a)-S(15*a/16))$.

$Q4=\{(cL, cR)|cL \text{ belongs to } (3*a/16, a/4] \text{ and } cR \text{ belongs to } (13*a/16, 7*a/8]\}$;

Card(cL, cR) is denoted as q4, $q4=(S(a/4)-S(3*a/16))*(S(7*a/8)-S(13*a/16))$.

$Q5=\{(cL, cR)|cL \text{ belongs to } (5*a/16, 3*a/8] \text{ and } cR \text{ belongs to } (11*a/16, 3*a/4]\}$;

Card(cL, cR) is denoted as q5, $q5=(S(3*a/8)-S(5*a/16))*(S(3*a/4)-S(11*a/16))$.

$Q6=\{(cL, cR)|cL \text{ belongs to } (7*a/16, a/2] \text{ and } cR \text{ belongs to } (9*a/16, 5*a/8]\}$;

Card(cL, cR) is denoted as q6, $q6=(S(a/2)-S(7*a/16))*(S(5*a/8)-S(9*a/16))$.

2.2.3 $H(a)\sim(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha)$, $\alpha<N(a)$.

Maximum error is denoted as $O\alpha(a)$, $O\alpha(a)\sim 1/(\alpha+2)$.

$\alpha=2^\beta-2$, β belongs to N and $\beta>0$.

Let $\beta=[\ln(a/4)/\ln(2)]$, $O\alpha(a)\sim 0$ when $a>a0$.

$H(a)\sim(J(a)+p1+\dots+p14)/(J(a)+K(a)+p1+\dots+p14+q1+\dots+q14)$

Maximum error is denoted as $O14(a)$, $O14(a)\sim 1/16$.

$H(a)\sim(J(a)+p1+\dots+p30)/(J(a)+K(a)+p1+\dots+p30+q1+\dots+q30)$

Maximum error is denoted as $O30(a)$, $O30(a)\sim 1/32$.

$H(a)\sim(J(a)+p1+\dots+p62)/(J(a)+K(a)+p1+\dots+p62+q1+\dots+q62)$

Maximum error is denoted as $O62(a)$, $O62(a)\sim 1/64$.

$H(a)\sim(J(a)+p1+\dots+p126)/(J(a)+K(a)+p1+\dots+p126+q1+\dots+q126)$

Maximum error is denoted as $O126(a)$, $O126(a)\sim 1/128$.

...

2.3 Conclusions

$S(a)=Ch*(a/2-a/\ln(a))$, $Ch\sim 1$ when $a>a0$.

Error of $S(a)\sim a/2-a/\ln(a)$ is denoted as $Oe(a)$, $Oe(a)\sim 0$ when $a>a0$.

(1) $H(a)\sim(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha)$, $\alpha=2^\beta[\ln(a/4)/\ln(2)]-2$.

(2) If $T(a)=0$, then $H(a)\sim(S(a)-N(a)-X(a)+X(a-2))/(Y(a)-Y(a-2))$

But,

$$(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha)>(a/4-a/\ln(a)-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*((a/2-1)/2-(a/2-1)/\ln(a/2-1)+1)/2+((a/2-2)/2-(a/2-2)/\ln(a/2-2))*((a/2-2)/2-(a/2-2)/\ln(a/2-2)+1)/2)/(((a/2)/2-(a/2)/\ln(a/2))*(((a-1)/2-(a-1)/\ln(a-1))-((a/2-1)/2-(a/2-1)/\ln(a/2-1)))-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*(((a-3)/2-(a-3)/\ln(a-3))-((a/2-2)/2-(a/2-2)/\ln(a/2-2))))).$$

So, $T(a)>0$ when $a>a1$.

Error analysis endorse $a1(\text{minim})=0$, appendix.

Any $T(a)>0$, $a>0$.

Conclusion: If {1 is also a prime number} is true, then any even number greater than 0 can be written as the sum of two prime numbers.

(3) If $T(a)=1$, then $H(a)\sim(S(a)-N(a)+1-X(a)+X(a-2))/(Y(a)-Y(a-2))$

But,

$$(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha)>(a/4-a/\ln(a)+1-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*((a/2-1)/2-(a/2-1)/\ln(a/2-1)+1)/2+((a/2-2)/2-(a/2-2)/\ln(a/2-2))*((a/2-2)/2-(a/2-2)/\ln(a/2-2)+1)/2)/(((a/2)/2-(a/2)/\ln(a/2))*(((a-1)/2-(a-1)/\ln(a-1))-((a/2-1)/2-(a/2-1)/\ln(a/2-1)))-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*(((a-3)/2-(a-3)/\ln(a-3))-((a/2-2)/2-(a/2-2)/\ln(a/2-2))))).$$

So, $T(a)>1$ when $a>a2$.

Error analysis endorse $a2(\text{minim})=4$, appendix.

Any $T(a)>1$, $a>4$.

Conclusion: If {1 is also a prime number} is false, then any even number greater than 4 can be written as the sum of two prime numbers.

2.4 $T(a)$

The number of prime pair an even a can be written as is denoted as $T(a)$,

$$T(a)\sim(Y(a)-Y(a-2))*J(a)/(J(a)+K(a)+X(a)-X(a-2)-S(a)+N(a));$$

$$T(a)\sim(((a/2)/2-(a/2)/\ln(a/2))*(((a-1)/2-(a-1)/\ln(a-1))-((a/2-1)/2-(a/2-1)/\ln(a/2-1)))-((a/2-1)/2-(a/2-1)/\ln(a/2-1))*(((a-3)/2-(a-3)/\ln(a-3))-((a/2-2)/2-(a/2-2)/\ln(a/2-2))))*((a/4)/2-(a/4)/\ln(a/4))*(((3*a/4)/2-(3*a/4)/\ln(3*a/4))-((a/2)/2-(a/2)/\ln(a/2)))/(((a/4)/2-(a/4)/\ln(a/4))*(((3*a/4)/2-(3*a/4)/\ln(3*a/4))-((a/2)/2-(a/2)/\ln(a/2)))+(((a/2)/2-(a/2)/\ln(a/2))-((a/4)/2-(a/4)/\ln(a/4))*((a/2-a/\ln(a))-((3*a/4)/2-(3*a/4)/\ln(3*a/4))))+((a/2-1)/2-(a/2-1)/\ln(a/2-1))*((a/2-1)/2-(a/2-1)/\ln(a/2-1)+1)/2-((a/2-2)/2-(a/2-2)/\ln(a/2-2))*((a/2-2)/2-(a/2-2)/\ln(a/2-2)+1)/2+a/\ln(a)-a/4.$$

2.5 New Conjecture

$$J(a)/(J(a)+K(a))\sim(J(a)+p1+\dots+p\alpha)/(J(a)+K(a)+p1+\dots+p\alpha+q1+\dots+q\alpha).$$

APPENDIX

Function	If	Error
$N(a)=a/4,$ $a/2$ belongs to A; $N(a)=(a+2)/4,$ $a/2$ belongs to B. $a>0$	$N(a)\sim a/4$	$O(a)$
$H(a)=Z(a)/Y(a)$	$H(a)\sim H(a-2)$	$O_r(a)$
$H(a)=Z(a)/Y(a)$	$H(a)\sim (J(a)+p_1+\dots+p_\alpha)/(J(a)+K(a)+p_1+\dots+p_\alpha+q_1+\dots+q_\alpha)$	$O_\alpha(a)$
$S(a)=a/2-I(a)$	$S(a)\sim a/2-a/\ln(a)$	$O_e(a)$