A -27797772040142849 6472173 \* 2^32 (27797771369054208) + 671088641

B 4548762148012033

ax 6472173; 671088641

bx 1059091; 939524097

sieve:

Row 0: 1595; 4147337623; 1415787; 3630350829

Row 1: 165482; 4161808659; 146800640; 1610612737

ax: 4148918894; 1595 (Exp = -60)

bx: 4148918894; 1595

sieve:

Row 0: 989923140; 4007836801; 3276000090; 1540

Row 1: 3276000090; 1540; 2544025; 0

result: 989923140; 10559836981; 2547105; 0

|  |  |  |  |
| --- | --- | --- | --- |
| B | 1595 | 4148918894 | A |
| 0 | 0 | 1540 | 1595 |
| 2544025 | 3276000090 |
| 2547105 | 1540 | 4007836801 | 4148918894 |
| 3276000090 | 989923140 |
|  | 10559836981 | 989923140 |  |

0 \* 2^96

2,547,105\* 2^64

10,559,836,981\* 2^32

989,923,140

29,422,556,797,566,734,827,520

X

X

1,610,612,737

1.2644545325526901863503869090202e+32

Each digit is a 32-bit integer. When multiplying a 32-bit value by another 32-bit value, a 32-bit result and a 32-bit carry is produced.

2^32 = 4,294,967,296

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | C0, Hi | C0, Lo | C1, Hi | C1, Lo |
| R0 | 1595 | 4147337623 | 1415787 | 3630350829 |
| R1 | 165482 | 4161808659 | 146800640 | 1610612737 |

Result

|  |  |  |  |
| --- | --- | --- | --- |
| 96 | 64 | 32 | 1 |
| R0, C0-Hi | R1, Co Hi | R1, C0-Lo | R1, C1-Lo |
|  | R0, C0-Lo | R1, C1-Hi |  |
|  | R0, C1-Hi | R0, C1-Lo |  |

1’s R1, C1

Lo => 1’s 3

+1 Hi => 32’s 2

+1 R1, C0

Lo => 32’s 2

+1 Hi => 64’s 1

32’s R0, C1

Lo => 32’s 2

+1 Hi => 64’s 1

+ 1 R0, C0

Lo => 64’s 1

+1 Hi => 96’s 0

Process Rows and Columns from Last to first,

The first row starts with the 1’s

Each successive row increases the starting place (32’s, 64’s, etc.)

Each successive column increases the current place (32’s, 64’s, etc.)

The carry (i.e., Hi part) gets added to the current place + 1

|  |  |  |  |
| --- | --- | --- | --- |
| B | 1059091 | 939524097 | A |
| 1595 | 1595 | 1415787 | 6472173 |
| 4147337623 | 3630350829 |
| 4,148,918,892 | 165482 | 146800640 | 671088641 |
| 4161808659 | 1610612737 |
| 7,938,960,128 | 0 | 1155346202624 | 1234 |
| 1306918294 | 4026533074 |
|  | 1158263733655 | 4026533074 |  |

J0, I0 0

J0, I1 1

J0, I2 -> 2

J1, I0 1

J1, I1 2

J1, I2 -> 3

J2, I0 -> 2;

J2, I1 -> 3

J2, I2 -> 4

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 5 | 4 | 3 |
| 4 | 3 | 2 |
| 4 | 4 | 3 | 2 |
| 3 | 2 | 1 |
| 3 | 3 | 2 | 1 |
| 2 | 1 | 0 |
|  | 2 | 1 | 0 |

// 0, 1, 2, 1, 2, 3, 2, 3, 4

// 1, 2, 3, 2, 3, 4, 3, 4, 5

-

269 \* 2^32 = 1155346202624

= 4026533074

1,595 \* 2^96 1.2636891921025161846170260078592e+32

4,148,918,892 \* 2^64 76,534,044,983,302,599,220,471,529,472

7,938,960,128 \* 2^32 34,097,574,114,007,973,888

1,610,612,737 1,610,612,737

-0.00602768096723593793141715568851

\*

9.8635556059889517056815666506964e-4

=

-5.9454366395492942314714087867387e-6

-5.9454366395492942314714087867387e-6

-12644545325526901863503869e7 0902017

-5.945436639549294231471408 744326e-6

0.0000000000353482168348952044200646458987885

0.0000000000353482168348952044200646458987885

-0.00000594543663954929423147140839279151

3.5348216834895204420064636160963e-11

-0.000005945436639549294231471408 39279151

-0.00000594543663954929423147140839279151

-0.00000594543663954929423147140839279151

-0.00000594543663954929423147140839279151

{5469871617157281}

{10,939,743,234,315,062}

10,939,743,234,314,562

"0.000000000035348216834896770119302449"

"0.00000000003534821683489515453216856"

5469871617157281

5469871617157531 and returning False.

AreClose is comparing 15 characters of

-7187591862433 972224

-7187591862433 087489 and returning False.

-0.00000594543663954 8558333806591647

-0.00000594543663954929 0169445839

-0.000005945436639549294231471408 39279151

-0.000005945436639549294231471408 7867387e-6

-2875036744973 5888896

-2875036744973 2349953 and returning False.

-0.000005945436639548558333186206187

-0.000005945436639549290169445839

-0.00000594543663954855833313450736490184093764807

-0.0000059454366395492942314715351099522

-0.000005945436639549294231471408 39279151

0.0000000000353482168348952 04420066149556547602

0.0000000000353482168348952 15453216856

"0.000000000035348216834896770119302449"

"0.00000000003534821683489515453216856"

-0.000005945436639549 425694717399"

-0.00000594543663954929423255700761"

-0.000005945436639549293981094101

0.00000000003534821683488 64539511122006373007661

0.00000000003534821683489 515453216856

0.000000000035348216834895 204420066149556547602

46985839418018375078954479 / 2^-88

5469871617157281 / 2 ^ -87

10,939,743,234,314,562

1598845264893042 1822101123130814440956260953422779212261637488641

1598845264893042 2461508089762160766797802966561159488889094668289

15988452648930422461508089762160766797802966561159488889094668289

4093043878126188150146070979113156300237559439656829155608235081984

4093043878126188150146070979113156300237559439656829155608235081984

0.000000000035348216834895204420064648685360472 (Without Fill Msb)

0.00000000003534821683489520442006464397833581951 (With Fill Msb

0.00000000003534821683489520 2999782574

0.000000000035348216834895204420064639893274283

0.000000000035348216834895204419732201946

0.0000000000353482168348951 9976860831