

File PsiBounds/Readme:

Die Dateien mit der Endung psb enthalten die Ausgabe des Programms psi-bounds6 zur Berechnung oberer und unterer Schranken für die Funktion $f(x) = (\psi(x)-x)/\sqrt{x}$.

Erklärung der Ausgabe:

Die unter psi_params aufgeführten Parameter c und eps bezeichnen die Parameter der modifizierten Tschebyschow-Funktion $\psi_{\{c,eps\}}$. Unter grid_params bezeichnet x_0 den Anfangspunkt des betrachteten Intervalls $[x_0, 2x_0]$ (wobei der tatsächlich untersuchte Bereich etwa 6% über die Intervallgrenzen hinaus geht), s bezeichnet die Schrittweite und a den Verschiebungsparameter in Theorem 5.1. Die Parameter c, b, l, e und t unter bi_params bezeichnen die Parameter c, beta, lambda, epsilon und tau in der Interpolationsformel in Abschnitt 5.2.2. Die fft-Größe $R = 2^r$ im Verfahren in Abschnitt 5.2.1 ist unter fft_params angegeben. In dem Verfahren wird $T=R$ gewählt.

in prepare_data:

T_0 und T_1 bezeichnen die Unter- und Obergrenze des betrachteten Summenabschnitts, sowie T_m den Mittelpunkt. coeff_shift ist ein Exponent für die Koeffizienten der trigonometrischen Summen und N_zeros gibt die Anzahl der Koeffizienten an.

in trigsum:

csum gibt eine obere Abschätzung für die Koeffizientensumme (in der der Abfall durch den Logan-Kern bislang nicht berücksichtigt ist). D ist die Anzahl der Tschebyschow-Koeffizienten im Verfahren aus Abschnitt 5.2.1 und r ist $\log_2(\text{FFT-Größe})$.

in trigs_interpol:

Die trigonometrischen Summen werden mittels diskreter Faltung auf verschobenen Gittern ausgewertet. fft-bits gibt hier die Anzahl der simultanen Auswertungen an. q_0 ist die Anzahl der Auswertungen zwischen benachbarten Stützstellen für den ersten Abschnitt (erhöht sich beim durchkämmen des Intervalls $[x_0, 2x_0]$). error gibt eine Abschätzung des Approximationsfehlers für den Summenabschnitt an. xmin und xmax sind die Stellen an denen der kleinste (ymin) und größte (ymax) Wert der Summe aufgetreten ist.

Weitere Fehlerterme:

E1-E3 entspricht E1-E3 in Theorem 5.1. Die übrigen Fehlerterme rühren von Satz 2.3 her: E4 entspricht dem Fehler aus (2.29) und E5 dem aus (2.28).

Die Dateien mit der Endung cmp enthalten die Ausgabe des Programms psb-check. Dieses überprüft die von psi-bounds6 berechneten abschnittsweisen Extremstellen (x_{\min}, y_{\min}) und (x_{\max}, y_{\max}) durch direkte Auswertung der Summe über Nullstellen an x_{\min} und x_{\max} . Die Bezeichnungen entsprechen denen in psi-bounds6, die unter y_{\min} und y_{\max} angegebenen Werte sind die Ergebnisse der direkten Auswertung und die Abweichung von den Eingabewerten sind dahinter in Klammern angegeben.

File PsiBounds/1e10-1e12.cmp:

```
c: 2.1000e1
eps: 1.000000000e-6
T0: 0   T1: 12600000
xmin: 1.0017028449597892481e10
xmax: 1.1467847921236003926e10
ymin: -6.36357756690096e-1   (-9.58163e-14)
ymax: 7.21845625672255e-1   (2.25536e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 1e10.zsm
user   36.23
sys    0.18
eval   0:36.55
exit[0]
```

```
c: 2.1000e1
eps: 7.000000000e-7
T0: 0   T1: 18000000
```

```
xmin: 2.1728786225797484533e10
xmax: 2.5752741846603097630e10
ymin: -6.19991239718917e-1      (1.08294e-12)
ymax: 5.13289257572268e-1      (2.26796e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 2e10.zsm
user   53.17
sys    0.24
eval   0:53.74
exit[0]
```

```
c: 2.1000e1
eps: 5.000000000e-7
T0: 0   T1: 25200000
xmin: 3.8199776313516527497e10
xmax: 5.0229460129170163540e10
ymin: -5.93303776582624e-1      (-2.62384e-12)
ymax: 6.69625270688335e-1      (-1.66538e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 4e10.zsm
user   73.05
sys    0.40
eval   1:13.88
exit[0]
```

```
c: 2.2000e1
eps: 3.500000000e-7
T0: 0   T1: 37714286
xmin: 1.0138054462676435842e11
xmax: 1.1048634261641978600e11
ymin: -6.78717175933115e-1      (-3.11546e-12)
ymax: 7.34187612657412e-1      (-2.58793e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 8e10.zsm
user   109.09
sys    0.58
eval   1:50.40
exit[0]
```

```
c: 2.2000e1
eps: 2.500000000e-7
T0: 0   T1: 52800000
xmin: 3.3095785428924242533e11
xmax: 1.5375382716947949608e11
ymin: -7.52457827727313e-1      (2.68678e-12)
ymax: 5.59066283311678e-1      (1.67849e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 16e10.zsm
user   145.90
sys    0.72
eval   2:27.34
exit[0]
```

```
c: 2.2000e1
eps: 1.700000000e-7
T0: 0   T1: 77647060
xmin: 3.3095785662669966317e11
xmax: 4.0354282675407752844e11
ymin: -7.52670158392005e-1      (-2.00489e-12)
ymax: 6.56094258716224e-1      (-3.7758e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 32e10.zsm
user   213.22
sys    1.00
eval   3:34.88
exit[0]
```

```
c: 2.3000e1
eps: 1.150000000e-7
T0: 0   T1: 120000000
xmin: 7.8120354762084516692e11
```

```
xmax: 1.0353815206654097617e12
ymin: -5.44187681999050e-1      (9.50091e-13)
ymax: 6.35667952993247e-1      (3.24708e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 64e10.zsm
user   327.43
sys    1.64
eval   5:30.17
exit[0]
```

File PsiBounds/1e10-1e12.psb:

Parameters:

```
psi_params: c: 21.000000      eps: 1e-06
grid_params: x0:10000000000    s: 1000 a: 0.120000
bi_params:  c: 30      b: 16777216    l: 14680064    e: 2097152    t:
12582912
```

```
fft_params: size: 2097152      bits: 21
```

```
executing prepare_data...
      T0: 0    T1: 12600000    Tm: 6300000
      coeff_shift: 0
```

Nzeros: 27094978

```
executing trigsum...
      csum: 16.7573    D: 17    r: 21
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
```

```
executing trigs_interpol...
```

```
      fft-bits: 12
      round 1
```

```
q0: 2
      error <= 1.43582e-05
```

```
      xmin: 1.00170284495978924807348979073e10      ymin: -6.3635775669e-1
      xmax: 1.14678479212360039256745034967e10      ymax: 7.2184562567e-1
```

```
E1(MT): 0.017533      E2(WBTI): 0.037382      E3(IP): 0.038740      E4(ZS1):
0.005074      E5(ZS2): 0.010648
pd: 32.390000    ts1: 12.070000    ts2: 2.530000    fft: 11.430000    ip: 3.180000
```

```
-0.753206 < f(x) < 0.839549
for x in [9549222347.303080, 20928052153.697784]
```

```
./psi-bounds6 -x 10000000000 -c 21 -e 1e-6 -a .12 -z .6 -s 1000
user   58.52
```

```
sys      0.85
eval    1:00.36
exit[0]
```

Parameters:

```
psi_params: c: 21.000000      eps: 7e-07
grid_params: x0:20000000000    s: 1400 a: 0.120000
bi_params: c: 30      b: 16777216    l: 14680064    e: 2097152    t:
12582912
fft_params: size: 2097152    bits: 21
executing prepare_data...
      T0: 0    T1: 18000000    Tm: 9000000
      coeff_shift: 0
```

Nzeros: 39728909

```
executing trigsum...
      csum: 17.5912    D: 17    r: 21
```

```
0
1
2
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7
8
9
10
11
12
13
14
15
16
17
```

```
executing trigs_interpol...
```

```
      fft-bits: 12
      round 1
q0: 3
      error <= 2.06708e-05
```

```
      xmin: 2.17287862257974845329064932449e10    ymin: -6.1999123972e-1
      xmax: 2.57527418466030976301022713484e10    ymax: 5.1328925757e-1
```

```
E1(MT): 0.017357      E2(WBTI): 0.036268      E3(IP): 0.037268      E4(ZS1):
0.007323      E5(ZS2): 0.010872
pd: 41.530000    ts1: 16.360000    ts2: 2.500000    fft: 10.930000    ip: 4.020000
```

```
-0.736391 < f(x) < 0.628622
for x in [19098444007.062126, 41856105814.215279]
```

```
./psi-bounds6 -x 20000000000 -c 21 -e 7e-7 -a .12 -z .6 -s 1400
user    72.08
sys     1.10
eval   1:14.01
exit[0]
```

Parameters:

```
psi_params: c: 21.000000      eps: 5e-07
grid_params: x0:40000000000    s: 2000 a: 0.120000
```

```
bi_params: c: 30      b: 33554432    l: 29360128    e: 4194304    t:
25165824
```

```
fft_params: size: 4194304    bits: 22
```

```
executing prepare_data...
```

```
T0: 0    T1: 25200000    Tm: 12600000
```

```
coeff_shift: 0
```

```
Nzeros: 56969964
```

```
executing trigsum...
```

```
csum: 18.3964    D: 17    r: 22
```

```
0
1
2
3
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5
6
7
8
9
10
11
12
13
14
15
16
17
```

```
executing trigs_interpol...
```

```
fft-bits: 12
```

```
round 1
```

```
q0: 2
```

```
error <= 2.92854e-05
```

```
xmin: 3.81997763135165274970298643348e10
```

```
ymin: -5.9330377658e-1
```

```
xmax: 5.02294601291701635398202419457e10
```

```
ymax: 6.6962527069e-1
```

```
E1(MT): 0.017537    E2(WBTI): 0.035886    E3(IP): 0.036581    E4(ZS1):
```

```
0.010557    E5(ZS2): 0.011084
```

```
pd: 59.240000    ts1: 25.380000    ts2: 5.170000    fft: 22.760000    ip: 6.180000
```

```
-0.712028 < f(x) < 0.789112
```

```
for x in [38196887097.399017, 83744330866.596161]
```

```
./psi-bounds6 -x 40000000000 -c 21 -e 5e-7 -a .12 -z .6 -s 2000
```

```
user 112.49
```

```
sys 1.69
```

```
eval 1:58.06
```

```
exit[0]
```

```
Parameters:
```

```
psi_params: c: 22.000000    eps: 3.5e-07
```

```
grid_params: x0:80000000000    s: 2800 a: 0.120000
```

```
bi_params: c: 30      b: 33554432    l: 29360128    e: 4194304    t:
25165824
```

```
fft_params: size: 4194304    bits: 22
```

```
executing prepare_data...
```

```
T0: 0    T1: 37714286    Tm: 18857143
```

```
coeff_shift: 0
```

Nzeros: 87681314

executing trigsum...

csum: 19.385 D: 17 r: 22

0
1
2
3
4
5
6
7
8
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10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 3

error <= 4.46305e-05

xmin: 1.01380544626764358420550116895e11

ymin: -6.7871717593e-1

xmax: 1.10486342616419786003460127945e11

ymax: 7.3418761266e-1

E1(MT): 0.017361

E2(WBTI): 0.033606

E3(IP): 0.035398

E4(ZS1):

0.005680

E5(ZS2): 0.008861

pd: 97.630000

ts1: 36.080000

ts2: 5.090000

fft: 22.470000

ip: 7.840000

-0.787464 < f(x) < 0.843489

for x in [76393772819.709991, 167488664747.987946]

./psi-bounds6 -x 80000000000 -c 22 -e 3.5e-7 -a .12 -z .6 -s 2800

user 161.83

sys 2.90

eval 2:50.43

exit[0]

Parameters:

psi_params: c: 22.000000 eps: 2.5e-07

grid_params: x0:160000000000 s: 4000 a: 0.120000

bi_params: c: 30

b: 67108864

l: 58720256

e: 8388608

t:

50331648

fft_params: size: 8388608

bits: 23

executing prepare_data...

T0: 0

T1: 52800000

Tm: 26400000

coeff_shift: 0

Nzeros: 125581343

executing trigsum...

csum: 20.2298 D: 17 r: 23

0
1
2
3
4

```
5
6
7
8
9
10
11
12
13
14
15
16
17
executing trigs_interpol...
  fft-bits: 12
  round 1
q0: 2
  error <= 6.35675e-05

  xmin: 3.30957854289242425326307902581e11      ymin: -7.5245782773e-1
  xmax: 1.53753827169479496076528500196e11      ymax: 5.5906628331e-1

E1(MT): 0.017538      E2(WBTI): 0.033360      E3(IP): 0.034931      E4(ZS1):
0.008181      E5(ZS2): 0.009027
pd: 116.090000      ts1: 54.500000      ts2: 10.300000      fft: 47.320000      ip: 12.180000

-0.864114 < f(x) < 0.668789
for x in [152787543805.969727, 335041586457.855042]

./psi-bounds6 -x 160000000000 -c 22 -e 2.5e-7 -a .12 -z .6 -s 4000
user 227.91
sys 3.44
eval 3:53.86
exit[0]

Parameters:

psi_params: c: 22.000000      eps: 1.7e-07

grid_params: x0:320000000000      s: 5600 a: 0.120000

bi_params: c: 30      b: 67108864      l: 58720256      e: 8388608      t:
50331648

fft_params: size: 8388608      bits: 23

executing prepare_data...
  T0: 0      T1: 77647060      Tm: 38823530

  coeff_shift: 0

Nzeros: 189444430

executing trigsum...
  csum: 21.2203      D: 17      r: 23

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
```

```
15
16
17
executing trigs_interpol...
    fft-bits: 12
    round 1
q0: 3
    error <= 9.5477e-05

    xmin: 3.30957856626699663168661491920e11      ymin: -7.5267015839e-1
    xmax: 4.03542826754077528435162375817e11      ymax: 6.5609425872e-1

E1(MT): 0.016866      E2(WBTI): 0.031748      E3(IP): 0.033942      E4(ZS1):
0.011810      E5(ZS2): 0.009217
pd: 165.580000      ts1: 76.370000      ts2: 10.170000      fft: 47.420000      ip: 16.220000
```

```
-0.864913 < f(x) < 0.767372
for x in [305575084678.418091, 670083179348.507446]
```

```
./psi-bounds6 -x 320000000000 -c 22 -e 1.7e-7 -a .12 -z .6 -s 5600
user    301.46
sys     5.59
eval   5:20.33
exit[0]
```

Parameters:

```
psi_params: c: 23.000000      eps: 1.15e-07
grid_params: x0:640000000000      s: 8000 a: 0.120000
bi_params: c: 30      b: 134217728      l: 117440512      e: 16777216      t:
100663296
fft_params: size: 16777216      bits: 24
```

```
executing prepare_data...
    T0: 0      T1: 120000000      Tm: 60000000
    coeff_shift: 0
```

Nzeros: 301091714

```
executing trigsum...
    csum: 22.3668      D: 17      r: 24
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
executing trigs_interpol...
    fft-bits: 12
    round 1
q0: 2
    error <= 0.000151262

    xmin: 7.81203547620845166920790904674e11      ymin: -5.4418768200e-1
```


xmax: 1.03538152066540976171496635271e12

ymax: 6.3566795299e-1

E1(MT): 0.016136 E2(WBTI): 0.028962 E3(IP): 0.033623 E4(ZS1):
0.006353 E5(ZS2): 0.007386
pd: 257.380000 ts1: 130.220000 ts2: 21.670000 fft: 111.820000 ip: 25.020000

-0.643169 < f(x) < 0.735564
for x in [611150165323.244019, 1340294891914.706055]

```
./psi-bounds6 -x 640000000000 -c 23 -e 1.15e-7 -a .12 -z .6 -s 8000  
user 518.91  
sys 8.81  
eval 9:09.95  
exit[0]
```

```
./cmd1e10  
user 1453.23  
sys 24.40  
eval 25:27.08  
exit[0]
```

File PsiBounds/1e12-1e14.cmp:

```
c: 2.3000e1  
eps: 1.000000000e-7  
T0: 0    T1: 138000000  
xmin: 2.0473883679740139771e12  
xmax: 1.6358203656679323941e12  
ymin: -6.79935329885433e-1    (4.5672e-12)  
ymax: 6.88467376315394e-1    (-4.60648e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 1e12.zsm  
user 375.95  
sys 2.26  
eval 6:19.73  
exit[0]
```

```
c: 2.4000e1  
eps: 7.000000000e-8  
T0: 0    T1: 205714286  
xmin: 2.0473883616676584070e12  
xmax: 3.7891682905567774041e12  
ymin: -6.80100084046138e-1    (3.86221e-12)  
ymax: 6.48731184087081e-1    (-2.91905e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 2e12.zsm  
user 567.13  
sys 2.70  
eval 9:32.10  
exit[0]
```

```
c: 2.4000e1  
eps: 5.000000000e-8  
T0: 0    T1: 288000000  
xmin: 4.4885228037790071989e12  
xmax: 6.1191818078249859287e12  
ymin: -6.17887117825250e-1    (-5.25006e-12)  
ymax: 6.12886269224623e-1    (4.62291e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 4e12.zsm  
user 863.87  
sys 4.98  
eval 14:31.95  
exit[0]
```

```
c: 2.5000e1  
eps: 3.500000000e-8  
T0: 0    T1: 428571430  
xmin: 1.1651299214544385780e13
```

```
xmax: 1.0235789707238821563e13
ymin: -6.88043798162340e-1      (-2.33952e-12)
ymax: 6.52162117077232e-1      (-2.76794e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 8e12.zsm
user   1339.69
sys    8.67
eval   22:34.64
exit[0]
```

```
c: 2.5000e1
eps: 2.500000000e-8
T0: 0   T1: 600000000
xmin: 2.1105696005406017150e13
xmax: 1.6014652795530031408e13
ymin: -6.89120131422388e-1      (-2.38772e-12)
ymax: 5.75352788328330e-1      (-1.66965e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 16e12.zsm
user   1745.36
sys    10.23
eval   29:24.66
exit[0]
```

```
c: 2.6000e1
eps: 1.700000000e-8
T0: 0   T1: 917647060
xmin: 3.0572107260722196176e13
xmax: 3.6219716654216627966e13
ymin: -5.63271924870603e-1      (-6.03112e-13)
ymax: 8.35456702797563e-1      (-2.43668e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 32e12.zsm
user   2950.58
sys    13.02
eval   49:33.02
exit[0]
```

```
c: 2.6000e1
eps: 1.150000000e-8
T0: 0   T1: 1356521740
xmin: 1.1739694224270385653e14
xmax: 8.4670340492314300494e13
ymin: -6.78325830874666e-1      (-4.66589e-12)
ymax: 6.68096429782059e-1      (2.05868e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 64e12.zsm
user   4050.69
sys    17.26
eval   1:08:02
exit[0]
```

File PsiBounds/1e12-1e14.psb:

Parameters:

```
psi_params: c: 23.000000      eps: 1e-07
grid_params: x0:1000000000000    s: 10000      a: 0.120000
bi_params: c: 30      b: 134217728    l: 117440512    e: 16777216    t:
100663296
fft_params: size: 16777216      bits: 24
executing prepare_data...
      T0: 0   T1: 138000000   Tm: 69000000
      coeff_shift: 0
```

Nzeros: 349325116

executing trigsum...

csum: 22.7413 D: 17 r: 24

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12
round 1

q0: 3

error <= 0.000175362

xmin: 2.04738836797401397714616233943e12

ymin: -6.7993532989e-1

xmax: 1.63582036566793239412790266340e12

ymax: 6.8846737632e-1

E1(MT): 0.017539 E2(WBTI): 0.030931 E3(IP): 0.033256 E4(ZS1):
0.007999 E5(ZS2): 0.007440
pd: 301.920000 ts1: 144.230000 ts2: 20.340000 fft: 104.560000 ip: 29.490000

-0.785051 < f(x) < 0.793668

for x in [954922131598.710693, 2094210772386.311035]

./psi-bounds6 -x 1000000000000 -c 23 -e 1e-7 -a .12 -z .6 -s 10000

user 573.55

sys 9.41

eval 10:03.24

exit[0]

Parameters:

psi_params: c: 24.000000 eps: 7e-08

grid_params: x0:2000000000000 s: 14000 a: 0.120000

bi_params: c: 30 b: 268435456 l: 234881024 e: 33554432 t:
201326592

fft_params: size: 33554432 bits: 25

executing prepare_data...

T0: 0 T1: 205714286 Tm: 102857143

coeff_shift: 0

Nzeros: 533804210

executing trigsum...

csum: 23.8281 D: 17 r: 25

0
1
2
3

4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 2

error <= 0.000267538

xmin: 2.04738836166765840702713671176e12

ymin: -6.8010008405e-1

xmax: 3.78916829055677740407976013991e12

ymax: 6.4873118409e-1

E1(MT): 0.017363

E2(WBTI): 0.029159

E3(IP): 0.032439

E4(ZS1):

0.004290

E5(ZS2): 0.005959

pd: 469.470000 ts1: 241.090000 ts2: 43.370000 fft: 261.990000 ip: 42.980000

-0.777276 < f(x) < 0.745593

for x in [1909844256321.978760, 4188622393628.168945]

./psi-bounds6 -x 2000000000000 -c 24 -e 7e-8 -a .12 -z .6 -s 14000

user 1005.77

sys 14.40

eval 17:43.89

exit[0]

Parameters:

psi_params: c: 24.000000 eps: 5e-08

grid_params: x0:4000000000000 s: 20000 a: 0.120000

bi_params: c: 30 b: 268435456 l: 234881024 e: 33554432 t:

201326592

fft_params: size: 33554432 bits: 25

executing prepare_data...

T0: 0 T1: 288000000 Tm: 144000000

coeff_shift: 0

Nzeros: 762748643

executing trigsum...

csum: 24.7638 D: 17 r: 25

0
1
2
3
4
5
6
7
8
9
10
11
12
13

```
14
15
16
17
executing trigs_interpol...
    fft-bits: 12
    round 1
q0: 3
    error <= 0.000381932

    xmin: 4.48852280377900719893115093549e12      ymin: -6.1788711782e-1
    xmax: 6.11918180782498592869630118149e12      ymax: 6.1288626922e-1

E1(MT): 0.017540      E2(WBTI): 0.029085      E3(IP): 0.032249      E4(ZS1):
0.006170      E5(ZS2): 0.006061
pd: 628.830000      ts1: 358.170000      ts2: 44.080000      fft: 372.120000      ip: 56.260000
```

```
-0.716471 < f(x) < 0.711420
for x in [3819688503476.712402, 8377244807361.741211]
```

```
./psi-bounds6 -x 4000000000000 -c 24 -e 5e-8 -a .12 -z .6 -s 20000
user    1403.00
sys     18.54
eval   24:24.89
exit[0]
```

Parameters:

```
psi_params: c: 25.000000      eps: 3.5e-08
grid_params: x0:8000000000000      s: 28000      a: 0.120000
bi_params: c: 30      b: 536870912      l: 469762048      e: 67108864      t:
402653184
fft_params: size: 67108864      bits: 26
```

```
executing prepare_data...
    T0: 0      T1: 428571430      Tm: 214285715

    coeff_shift: 0
```

Nzeros: 1162155601

```
executing trigsum...
    csum: 25.8923      D: 17      r: 26
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
```

```
executing trigs_interpol...
    fft-bits: 12
    round 1
q0: 2
    error <= 0.000581497
```

xmin: 1.16512992145443857799299379903e13 ymin: -6.8804379816e-1
 xmax: 1.02357897072388215633615387030e13 ymax: 6.5216211708e-1

E1(MT): 0.017364 E2(WBTI): 0.027479 E3(IP): 0.031522 E4(ZS1):
 0.003305 E5(ZS2): 0.004858
 pd: 969.030000 ts1: 595.160000 ts2: 89.010000 fft: 803.910000 ip: 86.150000

-0.780890 < f(x) < 0.744650
 for x in [7639376993202.532227, 16754891326882.501953]

./psi-bounds6 -x 8000000000000 -c 25 -e 3.5e-8 -a .12 -z .6 -s 28000
 user 2432.28
 sys 33.33
 eval 42:03.13
 exit[0]

Parameters:

psi_params: c: 25.000000 eps: 2.5e-08

grid_params: x0:16000000000000 s: 40000 a: 0.120000

bi_params: c: 30 b: 536870912 l: 469762048 e: 67108864 t:
 402653184

fft_params: size: 67108864 bits: 26

executing prepare_data...
 T0: 0 T1: 600000000 Tm: 300000000
 coeff_shift: 0

Nzeros: 1659148566

executing trigsum...
 csum: 26.8673 D: 17 r: 26

0
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17

executing trigs_interpol...

fft-bits: 12
 round 1

q0: 3
 error <= 0.000829823

xmin: 2.11056960054060171503606753336e13 ymin: -6.8912013142e-1
 xmax: 1.60146527955300314082342353275e13 ymax: 5.7535278833e-1

E1(MT): 0.017540 E2(WBTI): 0.027447 E3(IP): 0.031400 E4(ZS1):
 0.004750 E5(ZS2): 0.004939
 pd: 1373.150000 ts1: 772.510000 ts2: 87.090000 fft: 717.710000 ip: 111.950000

-0.783795 < f(x) < 0.668890
 for x in [15278753968070.589844, 33509782693976.808594]

```
./psi-bounds6 -x 16000000000000 -c 25 -e 2.5e-8 -a .12 -z .6 -s 40000
user 2940.59
sys 49.39
eval 51:02.48
exit[0]
```

Parameters:

```
psi_params: c: 26.000000      eps: 1.7e-08
grid_params: x0:32000000000000 s: 56000      a: 0.120000
bi_params: c: 30      b: 1073741824  l: 939524096  e: 134217728  t:
805306368
```

```
fft_params: size: 134217728  bits: 27
```

executing prepare_data...

```
T0: 0  T1: 917647060  Tm: 458823530
```

```
coeff_shift: 0
```

Nzeros: 2599574708

executing trigsum...

```
csum: 28.1242  D: 17  r: 27
```

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

```
fft-bits: 12
```

```
round 1
```

q0: 2

```
error <= 0.00129971
```

```
xmin: 3.05721072607221961763928590443e13  ymin: -5.6327192487e-1
xmax: 3.62197166542166279664538639524e13  ymax: 8.3545670280e-1
```

```
E1(MT): 0.016868      E2(WBTI): 0.025305      E3(IP): 0.030742      E4(ZS1):
0.002545      E5(ZS2): 0.003968
pd: 2077.180000  ts1: 1176.380000      ts2: 173.000000  fft: 1433.770000
ip: 175.420000
```

```
-0.650451 < f(x) < 0.925358
for x in [30557507906805.917969, 67020368830741.148438]
```

```
./psi-bounds6 -x 32000000000000 -c 26 -e 1.7e-8 -a .12 -z .6 -s 56000
user 4810.12
sys 74.17
eval 1:22:43
exit[0]
```

Parameters:

```
psi_params: c: 26.000000      eps: 1.15e-08
```

grid_params: x0:64000000000000 s: 80000 a: 0.120000

bi_params: c: 30 b: 1073741824 l: 939524096 e: 134217728 t:
805306368

fft_params: size: 134217728 bits: 27

executing prepare_data...

T0: 0 T1: 1356521740 Tm: 678260870

coeff_shift: 0

Nzeros: 3927236483

executing trigsum...

csum: 29.3058 D: 17 r: 27

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12
round 1

q0: 3

error <= 0.00196309

xmin: 1.17396942242703856533392304516e14 ymin: -6.7832583087e-1
xmax: 8.46703404923143004944164509824e13 ymax: 6.6809642978e-1

E1(MT): 0.016137 E2(WBTI): 0.024077 E3(IP): 0.030672 E4(ZS1):
0.003665 E5(ZS2): 0.004041
pd: 3133.000000 ts1: 1701.110000 ts2: 179.170000 fft: 1613.330000
ip: 238.510000

-0.766489 < f(x) < 0.756158
for x in [61115015773275.820312, 134040737749948.468750]

./psi-bounds6 -x 64000000000000 -c 26 -e 1.15e-8 -a .12 -z .6 -s 80000

user 6588.29
sys 123.40
eval 1:53:35
exit[0]

./cmd1e12

user 19753.64
sys 322.68
eval 5:41:36
exit[0]

File PsiBounds/1e14-1e16.cmp:

c: 2.6000e1
eps: 1.000000000e-8


```
T0: 0 T1: 1560000000
xmin: 1.1739694227036626481e14
xmax: 1.4852119393401966209e14
ymin: -6.78336207643025e-1 (-3.02501e-12)
ymax: 6.15245076815109e-1 (5.10895e-12)

/home/buethe/Programs/psi-bounds6/psb-check 1e14.zsm
user 5016.67
sys 26.14
eval 1:24:31
exit[0]
```

```
c: 2.6000e1
eps: 7.000000000e-9
T0: 0 T1: 2228571430
xmin: 2.5355085772106717159e14
xmax: 3.4832350686934411956e14
ymin: -4.88253473029347e-1 (6.53331e-13)
ymax: 6.49291609811887e-1 (1.88749e-12)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 2e14.zsm
user 7243.20
sys 36.59
eval 2:02:02
exit[0]
```

```
c: 2.7000e1
eps: 5.000000000e-9
T0: 0 T1: 3221225472
xmin: 6.0614696596229866237e14
xmax: 4.8009517009369721548e14
ymin: -5.45405924581840e-1 (-1.84011e-12)
ymax: 6.23930064186885e-1 (-3.11533e-12)
```

```
T0: 3221225472 T1: 3240000000
xmin: 6.6392984795047810142e14
xmax: 6.6392984730296144978e14
ymin: -1.17119028907409e-7 (2.59079e-18)
ymax: 1.17119881794233e-7 (-5.76698e-18)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 4e14.zsm
user 10829.73
sys 51.95
eval 3:01:49
exit[0]
```

```
c: 2.7000e1
eps: 3.500000000e-9
T0: 0 T1: 3221225472
xmin: 1.0479302914750302630e15
xmax: 1.2125625203720597586e15
ymin: -7.04207715757730e-1 (2.26993e-12)
ymax: 7.75206708569765e-1 (-2.34659e-13)
```

```
T0: 3221225472 T1: 4628571430
xmin: 8.1916694474571005814e14
xmax: 8.1916694554462614746e14
ymin: -7.56150292801463e-6 (4.08537e-15)
ymax: 7.51064751904012e-6 (-6.15988e-15)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 8e14.zsm
user 15625.96
sys 71.95
eval 4:22:19
exit[0]
```

```
c: 2.7000e1
eps: 2.500000000e-9
T0: 0 T1: 3221225472
xmin: 2.4380699287963845684e15
xmax: 3.2953166605951666128e15
```

```
ymin: -5.52267560452345e-1 (-2.34451e-12)
ymax: 7.52702539907089e-1 (-2.91088e-12)
```

```
T0: 3221225472 T1: 6442450944
xmin: 2.3437077479959960324e15
xmax: 2.3437077501059359946e15
ymin: -3.16467651820053e-5 (-1.00527e-15)
ymax: 3.14020935784492e-5 (4.49207e-16)
```

```
T0: 6442450944 T1: 6480000000
xmin: 1.8697056287925769698e15
xmax: 1.8697056278808349143e15
ymin: -8.46007458568553e-8 (2.14466e-18)
ymax: 8.46024026452542e-8 (-1.74585e-18)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 16e14.zsm
```

```
user 21917.63
```

```
sys 96.30
```

```
eval 6:07:48
```

```
exit[0]
```

```
c: 2.8000e1
```

```
eps: 1.700000000e-9
```

```
T0: 0 T1: 3221225472
```

```
xmin: 6.0705240062899501426e15
xmax: 3.2953166814768002647e15
ymin: -6.33024291467014e-1 (2.98576e-12)
ymax: 7.52719868368405e-1 (-1.59496e-12)
```

```
T0: 3221225472 T1: 6442450944
xmin: 5.3275430652244789679e15
xmax: 3.6806704794205731653e15
ymin: -7.87328884073373e-5 (6.62745e-16)
ymax: 7.80688205784638e-5 (-3.53617e-15)
```

```
T0: 6442450944 T1: 9663676416
xmin: 5.5342411841319835354e15
xmax: 4.5377552476810508758e15
ymin: -7.11142893023182e-6 (1.76818e-15)
ymax: 6.97748763466283e-6 (6.28253e-17)
```

```
T0: 9663676416 T1: 9882352942
xmin: 6.3479022126450863432e15
xmax: 6.3479022228159721124e15
ymin: -1.29477136193799e-7 (-3.37987e-17)
ymax: 1.28953526189937e-7 (4.9937e-17)
```

```
/home/buethe/Programs/psi-bounds6/psb-check 32e14.zsm
```

```
user 33678.61
```

```
sys 209.33
```

```
eval 9:29:41
```

```
exit[0]
```

```
c: 2.8000e1
```

```
eps: 1.150000000e-9
```

```
T0: 0 T1: 3221225472
```

```
xmin: 6.3211967392641610531e15
xmax: 1.1897046652720834995e16
ymin: -6.25700688369818e-1 (1.81613e-13)
ymax: 5.62275751243740e-1 (3.74014e-12)
```

```
T0: 3221225472 T1: 6442450944
xmin: 1.2031585315182606739e16
xmax: 7.3018868531233931810e15
ymin: -1.29210533520178e-4 (-1.7763e-16)
ymax: 1.26764636542821e-4 (2.82054e-15)
```

```
T0: 6442450944 T1: 9663676416
xmin: 1.2677461252093635627e16
xmax: 1.2487856492582488883e16
ymin: -3.08593019715725e-5 (-8.57255e-15)
```

ymin: 3.04665256548949e-5 (7.89495e-15)

T0: 9663676416 T1: 12884901888

xmin: 6.9388671993334227457e15

xmax: 1.1992878634911860915e16

ymin: -5.30270209377680e-6 (-1.5768e-15)

ymin: 5.09306452009134e-6 (6.91339e-16)

T0: 12884901888 T1: 14608695652

xmin: 8.4251983583305613155e15

xmax: 8.4251983641997875079e15

ymin: -5.63973137027522e-7 (-1.17522e-16)

ymin: 5.65033482380464e-7 (1.20464e-16)

/home/buethe/Programs/psi-bounds6/psb-check 64e14.zsm

user 50301.48

sys 224.63

eval 14:04:06

exit[0]

File PsiBounds/1e14-1e16.psb:

Parameters:

psi_params: c: 26.000000 eps: 1e-08

grid_params: x0:1000000000000000 s: 100000 a: 0.120000

bi_params: c: 30 b: 1073741824 l: 939524096 e: 134217728 t:
805306368

fft_params: size: 134217728 bits: 27

executing prepare_data...

T0: 0 T1: 1560000000 Tm: 780000000

coeff_shift: 0

Nzeros: 4551022287

executing trigsum...

csum: 29.7343 D: 17 r: 27

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 5

error <= 0.00227476

xmin: 1.17396942270366264810251391070e14

ymin: -6.7833620764e-1

xmax: 1.48521193934019662092196834161e14

ymax: 6.1524507681e-1

E1(MT): 0.017540 E2(WBTI): 0.025833 E3(IP): 0.030459 E4(ZS1):
0.004611 E5(ZS2): 0.004067
pd: 3624.570000 ts1: 2264.500000 ts2: 179.960000 fft: 1855.800000
ip: 528.070000

-0.770775 < f(x) < 0.707053
for x in [95492212128555.390625, 209438652771994.531250]

./psi-bounds6 -x 1000000000000000 -c 26 -e 1e-8 -a .12 -z .6 -s 100000
user 8175.73
sys 134.84
eval 2:21:02
exit[0]

Parameters:

psi_params: c: 26.000000 eps: 7e-09

grid_params: x0:2000000000000000 s: 140000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 2228571430 Tm: 1114285715

coeff_shift: 0

Nzeros: 6627968793

executing trigsum...

csum: 30.8417 D: 17 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12
round 1

q0: 5

error <= 0.00331252

xmin: 2.53550857721067171593119236704e14 ymin: -4.8825347303e-1
xmax: 3.48323506869344119560015697595e14 ymax: 6.4929160981e-1

E1(MT): 0.017364 E2(WBTI): 0.025380 E3(IP): 0.029870 E4(ZS1):
0.006627 E5(ZS2): 0.004134
pd: 5323.530000 ts1: 3132.030000 ts2: 360.990000 fft: 3547.010000
ip: 846.490000

-0.580724 < f(x) < 0.743372
for x in [190984424188355.375000, 418879816275009.312500]

```
./psi-bounds6 -x 2000000000000000 -c 26 -e 7e-9 -a .12 -z .6 -s 140000  
user 12694.73  
sys 217.84  
eval 3:40:59  
exit[0]
```

Parameters:

```
psi_params: c: 27.000000      eps: 5e-09  
grid_params: x0:4000000000000000 s: 200000      a: 0.120000  
bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:  
1610612736
```

```
fft_params: size: 268435456      bits: 28
```

executing prepare_data...

```
T0: 0      T1: 3221225472      Tm: 1610612736
```

```
coeff_shift: 0
```

Nzeros: 9769079475

executing trigsum...

```
csum: 32.0068      D: 17      r: 28
```

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

```
fft-bits: 12
```

```
round 1
```

q0: 5

```
error <= 0.00488199
```

```
xmin: 6.06146965962298662367482325890e14
```

```
ymin: -5.4540592458e-1
```

```
xmax: 4.80095170093697215476769567292e14
```

```
ymax: 6.2393006419e-1
```

executing prepare_data...

```
T0: 3221225472      T1: 3240000000      Tm: 3230612736
```

```
coeff_shift: -10
```

Nzeros: 59934663

executing trigsum...

```
csum: 0.0185522      D: 14      r: 28
```

0
1
2
3
4
5
6

7
8
9
10
11
12
13
14

executing trigs_interpol...

fft-bits: 12

round 2

q0: 5

error <= 8.49264e-07

xmin: 6.63929847950478101422597465429e14

ymin: -1.1711902891e-7

xmax: 6.63929847302961449783784872460e14

ymax: 1.1711988180e-7

E1(MT): 0.017540 E2(WBTI): 0.024529 E3(IP): 0.029852 E4(ZS1):

0.003537 E5(ZS2): 0.003315

pd: 7493.430000 ts1: 4696.280000 ts2: 628.270000 fft: 6190.550000

ip: 1991.430000

-0.635401 < f(x) < 0.714710

for x in [381968848285038.937500, 837759632751082.375000]

./psi-bounds6 -x 4000000000000000 -c 27 -e 5e-9 -a .12 -z .6 -s 200000

user 20121.18

sys 352.76

eval 5:48:11

exit[0]

Parameters:

psi_params: c: 27.000000 eps: 3.5e-09

grid_params: x0:8000000000000000 s: 280000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 3221225472 Tm: 1610612736

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
2
3
4
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6
7
8
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10
11
12
13
14
15
16
17

executing trigs_interpol...

```
fft-bits: 12
round 1
q0: 9
error <= 0.00488199

xmin: 1.04793029147503026296132495932e15      ymin: -7.0420771576e-1
xmax: 1.21256252037205975858921256195e15      ymax: 7.7520670857e-1

executing prepare_data...
T0: 3221225472  T1: 4628571430  Tm: 3924898451

coeff_shift: -4

Nzeros: 4535117469

executing trigsum...
csum: 1.16747  D: 16  r: 28

0
1
2
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9
10
11
12
13
14
15
16
executing trigs_interpol...
fft-bits: 12
round 2
q0: 9
error <= 0.000142445

xmin: 8.19166944745710058135778179132e14      ymin: -7.5615029321e-6
xmax: 8.19166945544626147463055563650e14      ymax: 7.5106475252e-6

E1(MT): 0.017364      E2(WBTI): 0.024116      E3(IP): 0.029303      E4(ZS1):
0.005081      E5(ZS2): 0.003367
pd: 10798.980000      ts1: 6606.670000      ts2: 662.430000  fft: 6561.370000
ip: 2307.170000

-0.796406 < f(x) < 0.868115
for x in [763937696432570.500000, 1675519265803761.250000]

./psi-bounds6 -x 8000000000000000 -c 27 -e 3.5e-9 -a .12 -z .6 -s 280000
user 26013.42
sys 360.37
eval 7:25:08
exit[0]

Parameters:

psi_params: c: 27.000000      eps: 2.5e-09

grid_params: x0:1600000000000000      s: 400000      a: 0.120000

bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:
1610612736

fft_params: size: 268435456      bits: 28

executing prepare_data...
T0: 0  T1: 3221225472  Tm: 1610612736
```

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
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13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 9

error <= 0.00488199

xmin: 2.43806992879638456838659886488e15

ymin: -5.5226756045e-1

xmax: 3.29531666059516661284756154358e15

ymax: 7.5270253991e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
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12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 2

q0: 9

error <= 0.000655356

xmin: 2.34370774799599603242450600216e15

ymin: -3.1646765181e-5

xmax: 2.34370775010593599464308907176e15

ymax: 3.1402093578e-5

executing prepare_data...

T0: 6442450944 T1: 6480000000 Tm: 6461225472

coeff_shift: -10

Nzeros: 124011655

executing trigsum...

csum: 0.0191933 D: 14 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14

executing trigs_interpol...

fft-bits: 12

round 3

q0: 9

error <= 8.8053e-07

xmin: 1.86970562879257696980183177637e15

ymin: -8.4600745859e-8

xmax: 1.86970562788083491426805451597e15

ymax: 8.4602402647e-8

E1(MT): 0.017540 E2(WBTI): 0.024164 E3(IP): 0.029316 E4(ZS1):
0.007292 E5(ZS2): 0.003417
pd: 15161.550000 ts1: 8760.740000 ts2: 930.670000 fft:
11172.170000 ip: 4129.690000

-0.646017 < f(x) < 0.848457

for x in [1527875392681799.000000, 3351038532009654.000000]

./psi-bounds6 -x 1600000000000000 -c 27 -e 2.5e-9 -a .12 -z .6 -s 400000

user 38883.54

sys 461.11

eval 11:02:36

exit[0]

Parameters:

psi_params: c: 28.000000 eps: 1.7e-09

grid_params: x0:3200000000000000 s: 560000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 3221225472 Tm: 1610612736

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1

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14
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16
17

executing trigs_interpol...

fft-bits: 12
round 1

q0: 13

error <= 0.00488199

xmin: 6.07052400628995014260294494879e15 ymin: -6.3302429147e-1
xmax: 3.29531668147680026470215670914e15 ymax: 7.5271986837e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
2
3
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12
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14
15
16

executing trigs_interpol...

fft-bits: 12
round 2

q0: 13

error <= 0.000655356

xmin: 5.32754306522447896791153107218e15 ymin: -7.8732888408e-5
xmax: 3.68067047942057316526189509962e15 ymax: 7.8068820582e-5

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1
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14
15
16

executing trigs_interpol...

fft-bits: 12

round 3

q0: 13

error <= 0.000336465

xmin: 5.53424118413198353538203504018e15

ymin: -7.1114289320e-6

xmax: 4.53775524768105087575627728646e15

ymax: 6.9774876346e-6

executing prepare_data...

T0: 9663676416 T1: 9882352942 Tm: 9773014679

coeff_shift: -8

Nzeros: 736614772

executing trigsum...

csum: 0.0753753 D: 14 r: 28

0
1
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8
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10
11
12
13
14

executing trigs_interpol...

fft-bits: 12

round 4

q0: 13

error <= 2.25773e-06

xmin: 6.34790221264508634318335392856e15

ymin: -1.2947713616e-7

xmax: 6.34790222281597211242030864338e15

ymax: 1.2895352614e-7

E1(MT): 0.016868

E2(WBTI): 0.022355

E3(IP): 0.028802

E4(ZS1):

0.003895

E5(ZS2): 0.002747

pd: 22068.320000

ts1: 12872.690000

ts2: 1179.800000

fft:

13846.430000

ip: 6972.760000

-0.720848 < f(x) < 0.841740

for x in [3055750785070229.500000, 6702077064662672.000000]

./psi-bounds6 -x 3200000000000000 -c 28 -e 1.7e-9 -a .12 -z .6 -s 560000

user 55371.24

sys 525.52

```
eval 15:36:22
exit[0]
```

```
Parameters:
```

```
psi_params: c: 28.000000      eps: 1.15e-09
```

```
grid_params: x0:6400000000000000      s: 800000      a: 0.120000
```

```
bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:
1610612736
```

```
fft_params: size: 268435456      bits: 28
```

```
executing prepare_data...
```

```
T0: 0      T1: 3221225472      Tm: 1610612736
```

```
coeff_shift: 0
```

```
Nzeros: 9769079475
```

```
executing trigsum...
```

```
csum: 32.0068      D: 17      r: 28
```

```
0
1
2
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7
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9
10
11
12
13
14
15
16
17
```

```
executing trigs_interpol...
```

```
fft-bits: 12
```

```
round 1
```

```
q0: 17
```

```
error <= 0.00488199
```

```
xmin: 6.32119673926416105313181064428e15
```

```
ymin: -6.2570068837e-1
```

```
xmax: 1.18970466527208349952821683064e16
```

```
ymax: 5.6227575124e-1
```

```
executing prepare_data...
```

```
T0: 3221225472      T1: 6442450944      Tm: 4831838208
```

```
coeff_shift: -3
```

```
Nzeros: 10479796488
```

```
executing trigsum...
```

```
csum: 2.25067      D: 16      r: 28
```

```
0
1
2
3
4
5
6
7
8
9
```

```
10
11
12
13
14
15
16
executing trigs_interpol...
  fft-bits: 12
  round 2
q0: 17
  error <= 0.000655356

  xmin: 1.20315853151826067393438093337e16      ymin: -1.2921053352e-4
  xmax: 7.30188685312339318098971845993e15      ymax: 1.2676463654e-4

executing prepare_data...
  T0: 6442450944  T1: 9663676416  Tm: 8053063680

  coeff_shift: -4

Nzeros: 10748052185

executing trigsum...
  csum: 1.35201  D: 16  r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
executing trigs_interpol...
  fft-bits: 12
  round 3
q0: 17
  error <= 0.000336465

  xmin: 1.26774612520936356273268233199e16      ymin: -3.0859301963e-5
  xmax: 1.24878564925824888825660235583e16      ymax: 3.0466525647e-5

executing prepare_data...
  T0: 9663676416  T1: 12884901888  Tm: 11274289152

  coeff_shift: -5

Nzeros: 10922257807

executing trigsum...
  csum: 0.975133  D: 16  r: 28
```

```
0
1
2
3
4
5
6
7
8
```

```
9
10
11
12
13
14
15
16
executing trigs_interpol...
  fft-bits: 12
  round 4
q0: 17
  error <= 0.000171363

  xmin: 6.93886719933342274567401056018e15      ymin: -5.3027020922e-6
  xmax: 1.19928786349118609149924558288e16      ymax: 5.0930645194e-6

executing prepare_data...
  T0: 12884901888 T1: 14608695652 Tm: 13746798770

  coeff_shift: -6

Nzeros: 5900050988

executing trigsum...
  csum: 0.429732 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
executing trigs_interpol...
  fft-bits: 12
  round 5
q0: 17
  error <= 4.68824e-05

  xmin: 8.42519835833056131551075240439e15      ymin: -5.6397313691e-7
  xmax: 8.42519836419978750794259538844e15      ymax: 5.6503348226e-7

E1(MT): 0.016137      E2(WBTI): 0.021310      E3(IP): 0.028839      E4(ZS1):
0.005599      E5(ZS2): 0.002793
pd: 33673.460000      ts1: 18972.820000      ts2: 1566.640000      fft:
17394.160000      ip: 11744.730000

-0.713765 < f(x) < 0.649702
for x in [6111501569737112.000000, 13404154130210044.000000]

./psi-bounds6 -x 6400000000000000 -c 28 -e 1.15e-9 -a .12 -z .6 -s 800000
user 81450.97
sys 493.45
eval 22:54:15
exit[0]

./cmd1e14
user 242710.84
sys 2545.95
eval 68:48:37
exit[0]
```

File PsiBounds/1e16-1e19.cmp:

c: 2.8000e1
eps: 2.000000000e-9
T0: 0 T1: 3221225472
xmin: 1.6452596771798687870e16
xmax: 1.8019655281538591025e16
ymin: -7.14047915600313e-1 (-3.12946e-13)
ymax: 5.71140474722614e-1 (2.61419e-12)

T0: 3221225472 T1: 6442450944
xmin: 1.2566038356423990981e16
xmax: 1.4289577135694622968e16
ymin: -5.91123432146073e-5 (-6.07297e-16)
ymax: 6.05549740530409e-5 (-9.59075e-16)

T0: 6442450944 T1: 7000000000
xmin: 1.4838215073769184787e16
xmax: 1.4838215080715454580e16
ymin: -2.06200333623590e-6 (-2.35901e-16)
ymax: 2.06313875512233e-6 (2.22334e-16)

../psb-check 1e16.zsm
user 23137.59
sys 106.59
eval 6:28:31
exit[0]

c: 2.8000e1
eps: 1.400000000e-9
T0: 0 T1: 3221225472
xmin: 2.0601340996597556945e16
xmax: 3.3050107922078447700e16
ymin: -6.97764869115829e-1 (4.17067e-12)
ymax: 5.32370202091411e-1 (1.41068e-12)

T0: 3221225472 T1: 6442450944
xmin: 2.3065221504561580200e16
xmax: 2.3065221485945012185e16
ymin: -1.04916358522334e-4 (-2.3341e-15)
ymax: 1.07222275181881e-4 (1.88096e-15)

T0: 6442450944 T1: 9663676416
xmin: 2.2125044618085400851e16
xmax: 2.9619966453493054931e16
ymin: -1.66824614580582e-5 (-5.82334e-17)
ymax: 1.63526178807503e-5 (7.50338e-16)

T0: 9663676416 T1: 10000000000
xmin: 2.5935485401389454632e16
xmax: 2.5935485393341259682e16
ymin: -9.31311014750237e-7 (1.97625e-17)
ymax: 9.32643574737352e-7 (-2.26479e-17)

../psb-check 2e16.zsm
user 33671.53
sys 165.93
eval 9:25:41
exit[0]

c: 2.9000e1
eps: 1.000000000e-9
T0: 0 T1: 3221225472
xmin: 5.3301083794598679566e16
xmax: 4.5261294959610828887e16
ymin: -4.91028368398703e-1 (1.29735e-12)
ymax: 5.69097482654463e-1 (4.46277e-12)

T0: 3221225472 T1: 6442450944
xmin: 5.3991657415232756169e16
xmax: 6.2729017043663024537e16
ymin: -1.45503260104331e-4 (5.6691e-15)
ymax: 1.48771751937772e-4 (-2.22764e-15)

T0: 6442450944 T1: 9663676416
xmin: 8.1287447068889085201e16
xmax: 6.5014099133855408705e16
ymin: -4.52793409111453e-5 (-5.14531e-15)
ymax: 4.49545135451696e-5 (1.69551e-16)

T0: 9663676416 T1: 12884901888
xmin: 4.3240366484516257763e16
xmax: 4.3448278310130469336e16
ymin: -1.10939953741775e-5 (1.82255e-15)
ymax: 1.08245885139156e-5 (-8.43904e-17)

T0: 12884901888 T1: 14500000000
xmin: 8.0363799846036666682e16
xmax: 5.0095405869218075958e16
ymin: -1.91217427259161e-6 (-1.19161e-15)
ymax: 1.92302704827341e-6 (-2.65897e-17)

../psb-check 4e16.zsm
user 49513.36
sys 222.58
eval 13:51:03
exit[0]

c: 2.9000e1
eps: 7.000000000e-10
T0: 0 T1: 3221225472
xmin: 1.2554614957359585727e17
xmax: 1.0431271000369755299e17
ymin: -6.57535408302559e-1 (-2.55912e-12)
ymax: 6.11824717371600e-1 (1.59973e-12)

T0: 3221225472 T1: 6442450944
xmin: 1.4284590858653200005e17
xmax: 9.4057420596172930666e16
ymin: -1.70358482551296e-4 (8.70449e-15)
ymax: 1.68015659059897e-4 (-1.02964e-16)

T0: 6442450944 T1: 9663676416
xmin: 8.1287447067521861571e16
xmax: 1.2652088815010558353e17
ymin: -7.31838447463279e-5 (2.67211e-15)
ymax: 7.46851107613189e-5 (3.18937e-16)

T0: 9663676416 T1: 12884901888
xmin: 9.3615273776488201155e16
xmax: 1.2720363571590907544e17
ymin: -3.08351431479522e-5 (-9.52162e-16)
ymax: 3.04006360781173e-5 (-8.827e-16)

T0: 12884901888 T1: 16106127360
xmin: 9.6164758043354072530e16
xmax: 9.6164758022119179984e16
ymin: -1.23135160749331e-5 (6.68559e-17)
ymax: 1.23657994901025e-5 (1.02452e-16)

T0: 16106127360 T1: 19327352832
xmin: 1.4878627971393956819e17
xmax: 1.4878627968706769923e17
ymin: -4.12117738868859e-6 (-8.85885e-17)
ymax: 4.14465084983735e-6 (3.37354e-16)

T0: 19327352832 T1: 20714285714
xmin: 1.0436638085414768563e17
xmax: 1.0436638087021920831e17

ymin: -1.00885398432971e-6 (-2.97086e-17)
ymax: 1.00894004748676e-6 (-1.32436e-17)

../psb-check 8e16.zsm
user 66245.50
sys 281.92
eval 18:33:10
exit[0]

c: 3.0000e1
eps: 5.000000000e-10
T0: 0 T1: 3221225472
xmin: 2.1128944803679475533e17
xmax: 2.6617578917818940463e17
ymin: -5.57300605934225e-1 (-4.22472e-12)
ymax: 7.59703511621836e-1 (1.83575e-12)

T0: 3221225472 T1: 6442450944
xmin: 2.3408335667228224381e17
xmax: 2.8615823225685438608e17
ymin: -1.86228573469649e-4 (3.50663e-16)
ymax: 1.88164969520165e-4 (1.65294e-16)

T0: 6442450944 T1: 9663676416
xmin: 2.5845172470885116705e17
xmax: 2.5845172460360859059e17
ymin: -9.58040009962016e-5 (7.98437e-16)
ymax: 9.60354239446093e-5 (-3.90699e-16)

T0: 9663676416 T1: 12884901888
xmin: 1.7639413248627550945e17
xmax: 1.7639413243765736233e17
ymin: -5.15857229560351e-5 (-3.50617e-17)
ymax: 5.16307179964644e-5 (-5.3562e-16)

T0: 12884901888 T1: 16106127360
xmin: 1.9043453464414086212e17
xmax: 1.9043453460216152843e17
ymin: -3.00658542554097e-5 (5.90334e-16)
ymax: 3.04446495363104e-5 (-6.89571e-16)

T0: 16106127360 T1: 19327352832
xmin: 2.1657175479967308730e17
xmax: 1.7130427006249910893e17
ymin: -1.49774456897598e-5 (-7.59758e-16)
ymax: 1.50451219754901e-5 (4.90066e-16)

T0: 19327352832 T1: 22548578304
xmin: 1.5333143051674046265e17
xmax: 1.5333143053880387135e17
ymin: -7.78863878558788e-6 (5.41212e-15)
ymax: 7.85526655024008e-6 (-5.55992e-15)

T0: 22548578304 T1: 25769803776
xmin: 1.7949035693585078144e17
xmax: 1.7949035691301776508e17
ymin: -3.65441015178210e-6 (1.2179e-15)
ymax: 3.60514603808294e-6 (-1.21706e-15)

T0: 25769803776 T1: 28991029248
xmin: 2.3736855973123013506e17
xmax: 2.3736855975854199239e17
ymin: -1.53662084324605e-6 (-1.46047e-16)
ymax: 1.53207410381868e-6 (1.18681e-16)

T0: 28991029248 T1: 30000000000
xmin: 2.2692478593712343537e17
xmax: 2.2692478596055677928e17
ymin: -4.30821294777297e-7 (-5.72968e-17)
ymax: 4.31072245785463e-7 (5.54634e-17)

../psb-check 16e16.zsm
no timing data

c: 3.0000e1
eps: 3.500000000e-10
T0: 0 T1: 3221225472
xmin: 4.3482416320089846763e17
xmax: 3.9066575927740981811e17
ymin: -6.27392860638037e-1 (1.96287e-12)
ymax: 5.53137637262324e-1 (2.32411e-12)

T0: 3221225472 T1: 6442450944
xmin: 4.9947218228494573710e17
xmax: 4.3779566901144822907e17
ymin: -2.01958250966302e-4 (3.69821e-15)
ymax: 2.00132551393062e-4 (3.06175e-15)

T0: 6442450944 T1: 9663676416
xmin: 6.0757898351803802797e17
xmax: 6.0757898328064643782e17
ymin: -1.11897455414299e-4 (-4.29907e-15)
ymax: 1.13373555785505e-4 (5.50464e-15)

T0: 9663676416 T1: 12884901888
xmin: 3.7506997179887902458e17
xmax: 6.3858949740270405299e17
ymin: -6.57389761898259e-5 (-8.25872e-16)
ymax: 6.74346730096888e-5 (1.68879e-15)

T0: 12884901888 T1: 16106127360
xmin: 4.6637215675420453829e17
xmax: 4.6637215665050037082e17
ymin: -4.34412380173041e-5 (-3.30414e-15)
ymax: 4.30232178206003e-5 (3.60026e-15)

T0: 16106127360 T1: 19327352832
xmin: 3.7543465996035749319e17
xmax: 3.7543466003105048302e17
ymin: -3.00259995768648e-5 (1.35214e-16)
ymax: 3.01545759533951e-5 (-6.04865e-16)

T0: 19327352832 T1: 22548578304
xmin: 4.7512405961984577118e17
xmax: 4.7512405968989134093e17
ymin: -2.02859335050126e-5 (-1.01257e-15)
ymax: 2.02412305593631e-5 (1.36313e-15)

T0: 22548578304 T1: 25769803776
xmin: 5.8694824785035427447e17
xmax: 5.8694824792692243274e17
ymin: -1.28888026227332e-5 (2.66769e-16)
ymax: 1.29632544274301e-5 (-5.69862e-16)

T0: 25769803776 T1: 28991029248
xmin: 6.1472930720964703298e17
xmax: 6.1472930728050086344e17
ymin: -7.76688673216397e-6 (-3.63971e-16)
ymax: 7.75239669753291e-6 (5.32905e-16)

T0: 28991029248 T1: 32212254720
xmin: 6.1477268806594621927e17
xmax: 6.1477268813135437055e17
ymin: -4.81684320763972e-6 (8.60281e-16)
ymax: 4.83290145262806e-6 (-8.71944e-16)

T0: 32212254720 T1: 35433480192
xmin: 3.1830583413871421391e17
xmax: 3.1830583422765961967e17
ymin: -2.97006339147181e-6 (1.32819e-15)
ymax: 2.96737185611777e-6 (-9.82234e-16)

T0: 35433480192 T1: 38654705664
xmin: 4.4176331050232060512e17
xmax: 4.0506844342335841331e17
ymin: -1.55384792426638e-6 (-2.66378e-16)
ymax: 1.55649210462465e-6 (-7.53546e-17)

T0: 38654705664 T1: 41875931136
xmin: 3.3106270921769066855e17
xmax: 3.3106270924489952376e17
ymin: -8.60473500522893e-7 (-1.13289e-15)
ymax: 8.56499009334048e-7 (8.34048e-16)

T0: 41875931136 T1: 42857142858
xmin: 6.3299672474697613947e17
xmax: 6.3299672488944111684e17
ymin: -2.89984431338367e-7 (6.16326e-17)
ymax: 2.91514901044573e-7 (-8.54272e-17)

../psb-check 32e16.zsm
user 141798.65
sys 973.76
eval 39:58:29
exit[0]

c: 3.1000e1
eps: 2.500000000e-10
T0: 0 T1: 3221225472
xmin: 1.3250065251529270894e18
xmax: 8.7893631794852655838e17
ymin: -7.83738372378084e-1 (1.91575e-12)
ymax: 6.69270460083455e-1 (3.45542e-12)

T0: 3221225472 T1: 6442450944
xmin: 1.1452531407053755229e18
xmax: 8.6804585302613401923e17
ymin: -2.02347198211581e-4 (-1.58081e-15)
ymax: 2.09869771637990e-4 (-2.01005e-15)

T0: 6442450944 T1: 9663676416
xmin: 7.3396633228262633782e17
xmax: 7.3396633257261251913e17
ymin: -1.19591925744379e-4 (5.62123e-15)
ymax: 1.15142064602143e-4 (2.14325e-15)

T0: 9663676416 T1: 12884901888
xmin: 8.4243969695989299865e17
xmax: 8.4243969671654887025e17
ymin: -7.85676610308177e-5 (1.82329e-16)
ymax: 7.98538084958468e-5 (-1.53164e-16)

T0: 12884901888 T1: 16106127360
xmin: 1.3050753499097686703e18
xmax: 9.8886237075208303350e17
ymin: -5.26895954139139e-5 (1.08608e-15)
ymax: 5.32982855030112e-5 (1.11903e-17)

T0: 16106127360 T1: 19327352832
xmin: 1.0176500087053813642e18
xmax: 1.3256239707672150823e18
ymin: -3.94836445359168e-5 (1.0832e-15)
ymax: 3.98614340280310e-5 (3.03102e-15)

T0: 19327352832 T1: 22548578304
xmin: 8.9358319196821300530e17
xmax: 8.9358319182898044837e17
ymin: -3.20411000865349e-5 (-3.53492e-15)
ymax: 3.24024954177696e-5 (3.76959e-15)

T0: 22548578304 T1: 25769803776
xmin: 7.3235332147865983959e17
xmax: 7.3235332157250272261e17

ymin: -2.22999233809042e-5 (9.5826e-17)
ymax: 2.23102078942499e-5 (2.49874e-16)

T0: 25769803776 T1: 28991029248
xmin: 8.6655130380633336660e17
xmax: 8.6655130390081984379e17
ymin: -1.79930532097632e-5 (-7.6325e-16)
ymax: 1.80031277372942e-5 (1.29422e-15)

T0: 28991029248 T1: 32212254720
xmin: 8.9649556653797822221e17
xmax: 8.9649556644485399223e17
ymin: -1.30650539140390e-5 (-1.03901e-15)
ymax: 1.31272537504746e-5 (1.47462e-15)

T0: 32212254720 T1: 35433480192
xmin: 9.6002877479151192580e17
xmax: 6.1419528401208765117e17
ymin: -9.36008637914040e-6 (-5.40397e-16)
ymax: 9.37628932963340e-6 (-1.9666e-15)

T0: 35433480192 T1: 38654705664
xmin: 8.8281147651892124993e17
xmax: 8.8281147659719281779e17
ymin: -7.07990839848312e-6 (-7.83122e-16)
ymax: 7.06264465690555e-6 (7.05551e-16)

T0: 38654705664 T1: 41875931136
xmin: 7.5933268070347905616e17
xmax: 7.5933268076650552464e17
ymin: -4.98512889762513e-6 (3.74871e-16)
ymax: 4.91639452562115e-6 (-3.78847e-16)

T0: 41875931136 T1: 45097156608
xmin: 1.1581388822934394221e18
xmax: 1.1581388822075551576e18
ymin: -3.43691846550452e-6 (-1.40452e-15)
ymax: 3.43985449352903e-6 (1.32903e-15)

T0: 45097156608 T1: 48318382080
xmin: 6.2916521809718289923e17
xmax: 6.2916521805154237829e17
ymin: -2.42147502916250e-6 (-2.62497e-16)
ymax: 2.43581031641764e-6 (2.1764e-16)

T0: 48318382080 T1: 51539607552
xmin: 6.4014072644505962321e17
xmax: 6.4014072648375687288e17
ymin: -1.60910427198477e-6 (-1.38477e-15)
ymax: 1.61013927902705e-6 (1.22705e-15)

T0: 51539607552 T1: 54760833024
xmin: 1.0264570154690316007e18
xmax: 1.0264570154067881799e18
ymin: -1.05138622572234e-6 (-1.22339e-16)
ymax: 1.05196411916826e-6 (6.82567e-17)

T0: 54760833024 T1: 57982058496
xmin: 7.8937317547414340307e17
xmax: 7.8937317560589777170e17
ymin: -6.75807964042682e-7 (3.73184e-17)
ymax: 6.79347297501839e-7 (-3.81609e-17)

T0: 57982058496 T1: 61203283968
xmin: 8.4620243177024223889e17
xmax: 8.4620243172293300949e17
ymin: -4.25661231679109e-7 (-3.91092e-17)
ymax: 4.28253470999228e-7 (-7.71926e-19)

T0: 61203283968 T1: 62000000000
xmin: 1.1247776485967699416e18

```
xmax: 1.1247776484235638829e18
ymin: -1.46955602492262e-7      (-3.22622e-17)
ymax: 1.47201837221008e-7      (3.10078e-17)
```

```
../psb-check 64e16.zsm
user  213664.14
sys   1741.18
eval  60:30:03
exit[0]
```

```
c: 3.1000e1
eps: 1.9000000000e-10
T0: 0   T1: 3221225472
xmin: 1.3250065251520075776e18
xmax: 2.3182032289904324308e18
ymin: -7.83738533745535e-1      (4.46514e-12)
ymax: 5.93582100680064e-1      (6.40164e-14)
```

```
T0: 3221225472 T1: 6442450944
xmin: 2.0991135182368910302e18
xmax: 2.0991135168253862018e18
ymin: -2.11036865211548e-4      (-1.54802e-15)
ymax: 1.99688265757258e-4      (-2.74234e-15)
```

```
T0: 6442450944 T1: 9663676416
xmin: 2.1846635059859228589e18
xmax: 1.9405862716396768779e18
ymin: -1.13629662057501e-4      (2.49913e-15)
ymax: 1.13799772596851e-4      (-3.14866e-15)
```

```
T0: 9663676416 T1: 12884901888
xmin: 1.8916906324607979061e18
xmax: 1.6140919062935475927e18
ymin: -7.70807128650374e-5      (-3.7405e-17)
ymax: 7.65710242200108e-5      (1.0108e-15)
```

```
T0: 12884901888 T1: 16106127360
xmin: 1.6184213088667579581e18
xmax: 1.6184213092202936467e18
ymin: -6.06210895472306e-5      (1.76943e-15)
ymax: 6.02000871204558e-5      (-1.54417e-15)
```

```
T0: 16106127360 T1: 19327352832
xmin: 1.5895560590140649183e18
xmax: 1.5895560587354467261e18
ymin: -4.68550235574072e-5      (5.92826e-16)
ymax: 4.67135215201850e-5      (-8.15049e-16)
```

```
T0: 19327352832 T1: 22548578304
xmin: 1.6430201030016321827e18
xmax: 1.6430201032409049605e18
ymin: -3.65357782186944e-5      (-6.94438e-16)
ymax: 3.67029402076794e-5      (6.7938e-16)
```

```
T0: 22548578304 T1: 25769803776
xmin: 1.5113870541407254388e18
xmax: 1.5113870539358002023e18
ymin: -2.98336597901552e-5      (-1.55163e-16)
ymax: 2.96964695032933e-5      (2.933e-16)
```

```
T0: 25769803776 T1: 28991029248
xmin: 1.4213674016079671602e18
xmax: 1.4213674014463601082e18
ymin: -2.41022320264599e-5      (5.40058e-16)
ymax: 2.40926726540188e-5      (1.8823e-17)
```

```
T0: 28991029248 T1: 32212254720
xmin: 1.4776909065313132555e18
xmax: 1.4776909066818822624e18
ymin: -1.89376478156677e-5      (-6.67677e-16)
ymax: 1.89301596123714e-5      (3.71412e-16)
```

T0: 32212254720 T1: 35433480192
xmin: 2.1782366454042874449e18
xmax: 1.8586417676262323278e18
ymin: -1.48761688469022e-5 (9.78266e-17)
ymax: 1.49106003441164e-5 (1.11643e-15)

T0: 35433480192 T1: 38654705664
xmin: 2.2551917767572836148e18
xmax: 2.2551917769519881879e18
ymin: -1.23022071324112e-5 (5.88804e-16)
ymax: 1.22885066147783e-5 (-2.21713e-16)

T0: 38654705664 T1: 41875931136
xmin: 2.4816876745147094870e18
xmax: 2.4816876747000506222e18
ymin: -9.83271798227313e-6 (-1.07313e-15)
ymax: 9.83227858627124e-6 (1.07124e-15)

T0: 41875931136 T1: 45097156608
xmin: 1.7719704525258368354e18
xmax: 1.7719704523967622656e18
ymin: -8.14692151798525e-6 (-8.85252e-16)
ymax: 8.13049055111011e-6 (9.10109e-16)

T0: 45097156608 T1: 48318382080
xmin: 1.2344666650526648097e18
xmax: 1.2344666652984413947e18
ymin: -6.00917910843736e-6 (-2.37356e-16)
ymax: 6.00937839786270e-6 (3.62696e-16)

T0: 48318382080 T1: 51539607552
xmin: 1.4501601138669385663e18
xmax: 1.4501601137807876851e18
ymin: -4.74105778527378e-6 (-1.73781e-16)
ymax: 4.75789150402252e-6 (3.22521e-16)

T0: 51539607552 T1: 54760833024
xmin: 1.6191553612941915546e18
xmax: 1.6191553613906541105e18
ymin: -3.70431254743595e-6 (1.64046e-16)
ymax: 3.70740358500093e-6 (-1.99073e-16)

T0: 54760833024 T1: 57982058496
xmin: 2.0332448508362208652e18
xmax: 2.0332448507272658963e18
ymin: -2.94039478825337e-6 (-5.33668e-17)
ymax: 2.93738328528291e-6 (8.29135e-17)

T0: 57982058496 T1: 61203283968
xmin: 2.6266494416365758965e18
xmax: 2.4261406115558340345e18
ymin: -2.16065050955768e-6 (1.04232e-15)
ymax: 2.15544131992890e-6 (-8.71104e-16)

T0: 61203283968 T1: 64424509440
xmin: 2.1523301633025558153e18
xmax: 2.1523301631936048565e18
ymin: -1.55627268430480e-6 (9.52031e-17)
ymax: 1.55551780271482e-6 (-8.5179e-17)

T0: 64424509440 T1: 67645734912
xmin: 1.9405477421735111895e18
xmax: 1.9405477422714029955e18
ymin: -1.22697313562481e-6 (-2.48087e-17)
ymax: 1.22039096656466e-6 (6.46608e-17)

T0: 67645734912 T1: 70866960384
xmin: 1.6487960900135233561e18
xmax: 1.6487960900885650239e18
ymin: -9.02752151813196e-7 (-6.31961e-17)

ymin: 9.02550387066653e-7 (6.66525e-17)

T0: 70866960384 T1: 74088185856

xmin: 1.4534923376932064961e18

xmax: 1.4534923376284448651e18

ymin: -6.19298075074544e-7 (-2.45441e-17)

ymin: 6.17933832189736e-7 (-3.02635e-17)

T0: 74088185856 T1: 77309411328

xmin: 1.3533446188502227453e18

xmax: 1.3533446187967137639e18

ymin: -4.48575500322212e-7 (-5.72212e-16)

ymin: 4.51322539646069e-7 (6.36069e-16)

T0: 77309411328 T1: 80530636800

xmin: 2.5943757874367174042e18

xmax: 2.5943757875345919979e18

ymin: -3.15441528580721e-7 (8.59279e-16)

ymin: 3.18440270368573e-7 (-6.81427e-16)

T0: 80530636800 T1: 81578947368

xmin: 1.3692514543617098325e18

xmax: 1.3692514544158477435e18

ymin: -1.28812425003607e-7 (-1.36068e-17)

ymin: 1.28952898825848e-7 (1.5848e-17)

../psb-check 128e16.zsm

user 317377.34

sys 3666.12

eval 89:52:33

exit[0]

c: 3.1000e1

eps: 1.900000000e-10

T0: 0 T1: 6442450944

xmin: 3.3404472574593896394e18

xmax: 3.8772052803238039546e18

ymin: -6.19853924288262e-1 (1.73782e-12)

ymin: 6.56884158737783e-1 (-2.21739e-12)

T0: 6442450944 T1: 12884901888

xmin: 3.8854469905365101117e18

xmax: 2.7298197247945467622e18

ymin: -1.37324990953325e-4 (-3.3252e-15)

ymin: 1.39449265085246e-4 (-1.47536e-14)

T0: 12884901888 T1: 19327352832

xmin: 4.8498595931906210008e18

xmax: 4.0338339020678254313e18

ymin: -7.43856852493848e-5 (-3.84834e-16)

ymin: 7.40490982961896e-5 (-1.81037e-15)

T0: 19327352832 T1: 25769803776

xmin: 2.5956384111816137416e18

xmax: 3.1552198604636012856e18

ymin: -4.74952998460038e-5 (-3.00375e-15)

ymin: 4.73460087970821e-5 (-1.91787e-15)

T0: 25769803776 T1: 32212254720

xmin: 5.0704830610862166285e18

xmax: 5.0704830616400269096e18

ymin: -3.11792901195461e-5 (-6.54611e-15)

ymin: 3.10043182654106e-5 (6.41064e-15)

T0: 32212254720 T1: 38654705664

xmin: 5.1693023265129737097e18

xmax: 5.1693023260424327247e18

ymin: -2.07949110285854e-5 (-4.58539e-15)

ymin: 2.10253194370491e-5 (5.04911e-15)

T0: 38654705664 T1: 45097156608

xmin: 2.8789370472539812881e18
xmax: 2.8789370470417664132e18
ymin: -1.26089080197109e-5 (-7.10939e-16)
ymax: 1.25375975324218e-5 (4.21768e-16)

T0: 45097156608 T1: 51539607552
xmin: 3.0554503187846202694e18
xmax: 3.0554503185725459787e18
ymin: -7.65074285927965e-6 (3.20353e-16)
ymax: 7.66621432635355e-6 (-3.46446e-16)

T0: 51539607552 T1: 57982058496
xmin: 3.7610116391065648245e18
xmax: 3.7610116388898173245e18
ymin: -4.73961132883741e-6 (-5.37411e-16)
ymax: 4.71503989870465e-6 (5.04654e-16)

T0: 57982058496 T1: 64424509440
xmin: 2.8143814972688598122e18
xmax: 2.8143814974170793569e18
ymin: -2.69266510669449e-6 (-6.9449e-16)
ymax: 2.70168471325981e-6 (4.59808e-16)

T0: 64424509440 T1: 70866960384
xmin: 4.0402094364931102333e18
xmax: 4.0402094366934660106e18
ymin: -1.53947899693658e-6 (6.342e-17)
ymax: 1.53683505048757e-6 (-1.2429e-17)

T0: 70866960384 T1: 77309411328
xmin: 3.1589445379175734310e18
xmax: 3.1589445377864733721e18
ymin: -7.57522303679803e-7 (-7.39803e-16)
ymax: 7.56073178458448e-7 (7.38448e-16)

T0: 77309411328 T1: 81578947368
xmin: 2.5943757872258483611e18
xmax: 2.5943757875340185561e18
ymin: -3.43869286907844e-7 (8.52156e-16)
ymax: 3.43906365783658e-7 (-7.16342e-16)

../psb-check 256e16.zsm
user 301205.17
sys 3486.35
eval 85:35:27
exit[0]

c: 3.1000e1
eps: 1.900000000e-10
T0: 0 T1: 6442450944
xmin: 5.0565315456359376117e18
xmax: 5.8055234217189867109e18
ymin: -5.74147462597474e-1 (2.52552e-12)
ymax: 6.80346322301367e-1 (1.36693e-12)

T0: 6442450944 T1: 12884901888
xmin: 5.7003052391633735719e18
xmax: 6.8455678944766480801e18
ymin: -1.47746160991174e-4 (-1.17393e-15)
ymax: 1.37639640788791e-4 (-1.20863e-15)

T0: 12884901888 T1: 19327352832
xmin: 5.3670721899356560493e18
xmax: 9.4848279805543698641e18
ymin: -7.53121725903267e-5 (-8.3267e-15)
ymax: 7.78559024096986e-5 (-4.30143e-15)

T0: 19327352832 T1: 25769803776
xmin: 5.7009813336272228400e18
xmax: 6.9867732738286025819e18
ymin: -4.62982057411138e-5 (8.86181e-16)

ymin: 4.59629245942669e-5 (2.66914e-16)

T0: 25769803776 T1: 32212254720

xmin: 5.0704830610848610459e18

xmax: 5.0704830616311258734e18

ymin: -3.11849986924828e-5 (-4.82832e-16)

ymin: 3.09895492175428e-5 (-4.57157e-16)

T0: 32212254720 T1: 38654705664

xmin: 5.1693023265052732411e18

xmax: 5.1693023260362955152e18

ymin: -2.07806187667189e-5 (2.28108e-15)

ymin: 2.09703688471781e-5 (-2.8219e-15)

T0: 38654705664 T1: 45097156608

xmin: 7.0513770461260680558e18

xmax: 7.0513770466797295031e18

ymin: -1.35358980655518e-5 (-1.55177e-15)

ymin: 1.34485373128906e-5 (1.89062e-15)

T0: 45097156608 T1: 51539607552

xmin: 8.1153890453226619493e18

xmax: 8.1153890458542507264e18

ymin: -7.89196191968429e-6 (1.15714e-16)

ymin: 7.83903926262078e-6 (-7.92162e-17)

T0: 51539607552 T1: 57982058496

xmin: 5.4322477336906336123e18

xmax: 5.4322477340096710854e18

ymin: -4.63188356929920e-6 (4.3008e-15)

ymin: 4.60875903350873e-6 (-4.39127e-15)

T0: 57982058496 T1: 64424509440

xmin: 5.3926314746271356875e18

xmax: 5.3926314748862627047e18

ymin: -2.71252707470949e-6 (1.49051e-15)

ymin: 2.73346745410817e-6 (-1.49183e-15)

T0: 64424509440 T1: 70866960384

xmin: 5.5704387377384597150e18

xmax: 5.5704387379985372322e18

ymin: -1.52966558805712e-6 (-3.57115e-16)

ymin: 1.52714427060816e-6 (2.0816e-16)

T0: 70866960384 T1: 77309411328

xmin: 8.5451986923303710284e18

xmax: 8.5451986919488873816e18

ymin: -7.87504421006812e-7 (-6.6812e-17)

ymin: 7.90988627544016e-7 (2.40157e-17)

T0: 77309411328 T1: 81578947368

xmin: 7.9364606688637740440e18

xmax: 7.9364606685396260497e18

ymin: -3.35153273041627e-7 (1.68373e-16)

ymin: 3.33840602372859e-7 (-1.77141e-16)

../psb-check 512e16.zsm

user 286921.03

sys 3063.94

eval 81:01:38

exit[0]

File PsiBounds/1e16-1e19.psb:

Parameters:

psi_params: c: 28.000000 eps: 2e-09

grid_params: x0:1000000000000000000 s: 1000000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 3221225472 Tm: 1610612736

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
2
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14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 17

error <= 0.00488199

xmin: 1.64525967717986878702858821650e16

ymin: -7.1404791560e-1

xmax: 1.80196552815385910249286983259e16

ymax: 5.7114047472e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
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14
15
16

executing trigs_interpol...

```
fft-bits: 12
round 2
q0: 17
error <= 0.000655356

xmin: 1.25660383564239909806116738001e16      ymin: -5.9112343214e-5
xmax: 1.42895771356946229679314788596e16      ymax: 6.0554974054e-5

executing prepare_data...
T0: 6442450944 T1: 7000000000 Tm: 6721225472

coeff_shift: -6

Nzeros: 1844868795

executing trigsum...
csum: 0.274634 D: 15 r: 28

0
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11
12
13
14
15
executing trigs_interpol...
fft-bits: 12
round 3
q0: 17
error <= 1.52231e-05

xmin: 1.48382150737691847873662663477e16      ymin: -2.0620033360e-6
xmax: 1.48382150807154545795430163431e16      ymax: 2.0631387549e-6

E1(MT): 0.035080      E2(WBTI): 0.043686      E3(IP): 0.028696      E4(ZS1):
0.006838      E5(ZS2): 0.024952
pd: 15623.720000      ts1: 9395.650000      ts2: 896.770000 fft: 7595.950000
ip: 8171.940000

-0.867559 < f(x) < 0.723224
for x in [9549221203688240.000000, 20943990826316864.000000]

./psi-bounds6 -x 1000000000000000000 -c 28 -e 2e-9 -a .12 -z .5 -s 1000000
user 40495.78
sys 403.48
eval 11:25:24
exit[0]

Parameters:

psi_params: c: 28.000000      eps: 1.4e-09

grid_params: x0:2000000000000000000      s: 1400000      a: 0.120000

bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:
1610612736

fft_params: size: 268435456      bits: 28

executing prepare_data...
T0: 0 T1: 3221225472 Tm: 1610612736
```

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
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14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 25

error <= 0.00488199

xmin: 2.06013409965975569452156944188e16

ymin: -6.9776486912e-1

xmax: 3.30501079220784477003402216264e16

ymax: 5.3237020209e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
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12
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14
15
16

executing trigs_interpol...

fft-bits: 12

round 2

q0: 25

error <= 0.000655356

xmin: 2.30652215045615802003609919647e16

ymin: -1.0491635852e-4

xmax: 2.30652214859450121850740640193e16

ymax: 1.0722227518e-4

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1
2
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14
15
16

executing trigs_interpol...

fft-bits: 12

round 3

q0: 25

error <= 0.000336465

xmin: 2.21250446180854008510292536229e16

ymin: -1.6682461458e-5

xmax: 2.96199664534930549314246294690e16

ymax: 1.6352617880e-5

executing prepare_data...

T0: 9663676416 T1: 10000000000 Tm: 9831838208

coeff_shift: -8

Nzeros: 1133230167

executing trigsum...

csum: 0.115272 D: 15 r: 28

0
1
2
3
4
5
6
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11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 4

q0: 25

error <= 3.03183e-06

xmin: 2.59354854013894546324783750245e16

ymin: -9.3131101477e-7

xmax: 2.59354853933412596816715152754e16

ymax: 9.3264357476e-7

E1(MT): 0.034728

E2(WBTI): 0.043057

E3(IP): 0.028219

E4(ZS1):

```
0.009817      E5(ZS2): 0.025333
pd: 24122.270000      ts1: 13742.460000      ts2: 1347.590000      fft:
15539.000000      ip: 16759.250000
```

```
-0.853426 < f(x) < 0.686379
for x in [19098442406001428.000000, 41887981655649752.000000]
```

```
./psi-bounds6 -x 200000000000000000 -c 28 -e 1.4e-9 -a .12 -z .5 -s 1400000
user 69820.15
sys 494.01
eval 19:36:48
exit[0]
```

Parameters:

```
psi_params: c: 29.000000      eps: 1e-09
grid_params: x0:400000000000000000      s: 2000000      a: 0.120000
bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:
1610612736
fft_params: size: 268435456      bits: 28
```

```
executing prepare_data...
T0: 0      T1: 3221225472      Tm: 1610612736
coeff_shift: 0
```

Nzeros: 9769079475

```
executing trigsum...
csum: 32.0068      D: 17      r: 28
```

0
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12
13
14
15
16
17

```
executing trigs_interpol...
```

```
fft-bits: 12
round 1
```

```
q0: 33
error <= 0.00488199
```

```
xmin: 5.33010837945986795655804801946e16      ymin: -4.9102836840e-1
xmax: 4.52612949596108288873165195549e16      ymax: 5.6909748265e-1
```

```
executing prepare_data...
T0: 3221225472      T1: 6442450944      Tm: 4831838208
```

Nzeros: 10479796488

```
executing trigsum...
csum: 2.25067      D: 16      r: 28
```

0
1

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6
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8
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10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12
round 2

q0: 33

error <= 0.000655356

xmin: 5.39916574152327561685292123086e16 ymin: -1.4550326011e-4
xmax: 6.27290170436630245365798733857e16 ymax: 1.4877175194e-4

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1
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14
15
16

executing trigs_interpol...

fft-bits: 12
round 3

q0: 33

error <= 0.000336465

xmin: 8.12874470688890852012065314108e16 ymin: -4.5279340906e-5
xmax: 6.50140991338554087049671800606e16 ymax: 4.4954513545e-5

executing prepare_data...

T0: 9663676416 T1: 12884901888 Tm: 11274289152

coeff_shift: -5

Nzeros: 10922257807

executing trigsum...

csum: 0.975133 D: 16 r: 28

0

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11
12
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14
15
16

executing trigs_interpol...

fft-bits: 12
round 4

q0: 33

error <= 0.000171363

xmin: 4.32403664845162577634135120488e16 ymin: -1.1093995376e-5
xmax: 4.34482783101304693355642463832e16 ymax: 1.0824588514e-5

executing prepare_data...

T0: 12884901888 T1: 14500000000 Tm: 13692450944

coeff_shift: -6

Nzeros: 5527018163

executing trigsum...

csum: 0.404102 D: 15 r: 28

0
1
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12
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14
15

executing trigs_interpol...

fft-bits: 12
round 5

q0: 33

error <= 4.39701e-05

xmin: 8.03637998460366666816437602014e16 ymin: -1.9121742714e-6
xmax: 5.00954058692180759578747344029e16 ymax: 1.9230270483e-6

E1(MT): 0.035080 E2(WBTI): 0.041803 E3(IP): 0.028282 E4(ZS1):
0.005228 E5(ZS2): 0.021728
pd: 30646.290000 ts1: 18260.020000 ts2: 1467.540000 fft:
17333.480000 ip: 24364.420000

-0.635799 < f(x) < 0.714652
for x in [38196884810169472.000000, 83775963315320896.000000]

./psi-bounds6 -x 4000000000000000000 -c 29 -e 1e-9 -a .12 -z .5 -s 2000000 -v
user 90243.70
sys 502.87


```
eval 25:17:54
exit[0]
```

Parameters:

```
psi_params: c: 29.000000      eps: 7e-10
grid_params: x0:8000000000000000      s: 2800000      a: 0.120000
bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:
1610612736
fft_params: size: 268435456      bits: 28
```

```
executing prepare_data...
      T0: 0      T1: 3221225472      Tm: 1610612736
      coeff_shift: 0
```

Nzeros: 9769079475

```
executing trigsum...
      csum: 32.0068      D: 17      r: 28
```

0
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17

```
executing trigs_interpol...
      fft-bits: 12
      round 1
q0: 45
      error <= 0.00488199
```

```
      xmin: 1.25546149573595857269525321927e17      ymin: -6.5753540830e-1
      xmax: 1.04312710003697552989475220829e17      ymax: 6.1182471737e-1
```

```
executing prepare_data...
      T0: 3221225472      T1: 6442450944      Tm: 4831838208
      coeff_shift: -3
```

Nzeros: 10479796488

```
executing trigsum...
      csum: 2.25067      D: 16      r: 28
```

0
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11
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14
15
16

executing trigs_interpol...

fft-bits: 12

round 2

q0: 45

error <= 0.000655356

xmin: 1.42845908586532000047141169328e17

ymin: -1.7035848256e-4

xmax: 9.40574205961729306664170563709e16

ymax: 1.6801565906e-4

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1
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11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 3

q0: 45

error <= 0.000336465

xmin: 8.12874470675218615705565343314e16

ymin: -7.3183844749e-5

xmax: 1.26520888150105583531255219278e17

ymax: 7.4685110761e-5

executing prepare_data...

T0: 9663676416 T1: 12884901888 Tm: 11274289152

coeff_shift: -5

Nzeros: 10922257807

executing trigsum...

csum: 0.975133 D: 16 r: 28

0
1
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13
14
15
16

executing trigs_interpol...

fft-bits: 12
round 4

q0: 45

error <= 0.000171363

xmin: 9.36152737764882011553925112325e16
xmax: 1.27203635715909075443733101297e17

ymin: -3.0835143147e-5
ymax: 3.0400636079e-5

executing prepare_data...

T0: 12884901888 T1: 16106127360 Tm: 14495514624

coeff_shift: -5

Nzeros: 11051795925

executing trigsum...

csum: 0.765442 D: 15 r: 28

0
1
2
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13
14
15

executing trigs_interpol...

fft-bits: 12
round 5

q0: 45

error <= 0.000173385

xmin: 9.61647580433540725298414613924e16
xmax: 9.61647580221191799842652756595e16

ymin: -1.2313516075e-5
ymax: 1.2365799490e-5

executing prepare_data...

T0: 16106127360 T1: 19327352832 Tm: 17716740096

coeff_shift: -5

Nzeros: 11155025460

executing trigsum...

csum: 0.631295 D: 15 r: 28

0
1
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14
15

executing trigs_interpol...

fft-bits: 12

round 6

q0: 45

error <= 0.000174997

xmin: 1.48786279713939568185791638986e17

ymin: -4.1211773886e-6

xmax: 1.48786279687067699232610507358e17

ymax: 4.1446508495e-6

executing prepare_data...

T0: 19327352832 T1: 20714285714 Tm: 20020819273

coeff_shift: -7

Nzeros: 4830163420

executing trigsum...

csum: 0.241349 D: 15 r: 28

0
1
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14
15

executing trigs_interpol...

fft-bits: 12

round 7

q0: 45

error <= 1.96748e-05

xmin: 1.04366380854147685628223058520e17

ymin: -1.0088539843e-6

xmax: 1.04366380870219208305167296520e17

ymax: 1.0089400475e-6

E1(MT): 0.034728 E2(WBTI): 0.041215 E3(IP): 0.027828 E4(ZS1):

0.007503 E5(ZS2): 0.022049

pd: 45791.410000

ts1: 26840.750000

ts2: 2074.420000

fft:

20493.380000 ip: 48253.280000

-0.805605 < f(x) < 0.759436

for x in [76393769617588912.000000, 167551926636673952.000000]

./psi-bounds6 -x 800000000000000000 -c 29 -e 7e-10 -a .12 -z .5 -s 2800000 -v

user 140925.16

sys 654.26

eval 44:42:29

exit[0]

/home/buethe/usbdisk1/ZetaZeros/emz/zeros.RS0-RS20 Wed Apr 9 08:21:15 2014

Parameters:

psi_params: c: 30.000000

eps: 5e-10

grid_params: x0:16000000000000000000 s: 4000000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 3221225472 Tm: 1610612736

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
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14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 61

error <= 0.00488199

xmin: 2.11289448036794755331953449095e17

ymin: -5.5730060593e-1

xmax: 2.66175789178189404628503120227e17

ymax: 7.5970351162e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
2
3
4
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12
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14
15
16

executing trigs_interpol...

fft-bits: 12
round 2

q0: 61

error <= 0.000655356

xmin: 2.34083356672282243809883349844e17 ymin: -1.8622857347e-4
xmax: 2.86158232256854386081868483531e17 ymax: 1.8816496952e-4

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1
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14
15
16

executing trigs_interpol...

fft-bits: 12
round 3

q0: 61

error <= 0.000336465

xmin: 2.58451724708851167052278311354e17 ymin: -9.5804000997e-5
xmax: 2.58451724603608590591771414335e17 ymax: 9.6035423945e-5

executing prepare_data...

T0: 9663676416 T1: 12884901888 Tm: 11274289152

coeff_shift: -5

Nzeros: 10922257807

executing trigsum...

csum: 0.975133 D: 16 r: 28

0
1
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15

```
16
executing trigs_interpol...
  fft-bits: 12
  round 4
q0: 61
  error <= 0.000171363

  xmin: 1.76394132486275509446855414914e17      ymin: -5.1585722956e-5
  xmax: 1.76394132437657362332096872471e17      ymax: 5.1630717997e-5
```

```
executing prepare_data...
  T0: 12884901888 T1: 16106127360 Tm: 14495514624

  coeff_shift: -5
```

```
Nzeros: 11051795925
```

```
executing trigsum...
  csum: 0.765442 D: 15 r: 28
```

```
0
1
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7
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11
12
13
14
15
```

```
executing trigs_interpol...
  fft-bits: 12
  round 5
q0: 61
  error <= 0.000173385

  xmin: 1.90434534644140862121354611728e17      ymin: -3.0065854256e-5
  xmax: 1.90434534602161528425636893708e17      ymax: 3.0444649537e-5
```

```
executing prepare_data...
  T0: 16106127360 T1: 19327352832 Tm: 17716740096

  coeff_shift: -5
```

```
Nzeros: 11155025460
```

```
executing trigsum...
  csum: 0.631295 D: 15 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

executing trigs_interpol...

fft-bits: 12
round 6

q0: 61

error <= 0.000174997

xmin: 2.16571754799673087299665047367e17 ymin: -1.4977445689e-5
xmax: 1.71304270062499108934092475363e17 ymax: 1.5045121975e-5

executing prepare_data...

T0: 19327352832 T1: 22548578304 Tm: 20937965568

coeff_shift: -5

Nzeros: 11240871162

executing trigsum...

csum: 0.53788 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 7

q0: 61

error <= 0.000176338

xmin: 1.53331430516740462647394567043e17 ymin: -7.7886387910e-6
xmax: 1.53331430538803871352867457939e17 ymax: 7.8552665558e-6

executing prepare_data...

T0: 22548578304 T1: 25769803776 Tm: 24159191040

coeff_shift: -6

Nzeros: 11314361469

executing trigsum...

csum: 0.468989 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...


```
    fft-bits: 12
    round 8
q0: 61
    error <= 8.91526e-05

    xmin: 1.79490356935850781443791874798e17    ymin: -3.6544101530e-6
    xmax: 1.79490356913017765078672716388e17    ymax: 3.6051460393e-6
```

```
executing prepare_data...
    T0: 25769803776 T1: 28991029248 Tm: 27380416512
```

```
    coeff_shift: -6
```

```
Nzeros: 11378613650
```

```
executing trigsum...
    csum: 0.416034 D: 15 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

```
executing trigs_interpol...
    fft-bits: 12
    round 9
q0: 61
    error <= 8.96542e-05

    xmin: 2.37368559731230135055595153359e17    ymin: -1.5366208431e-6
    xmax: 2.37368559758541992387087347897e17    ymax: 1.5320741037e-6
```

```
executing prepare_data...
    T0: 28991029248 T1: 30000000000 Tm: 29495514624
```

```
    coeff_shift: -8
```

```
Nzeros: 3576108610
```

```
executing trigsum...
    csum: 0.121254 D: 15 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

```
executing trigs_interpol...
    fft-bits: 12
```

```

round 10
q0: 61
error <= 7.79979e-06

xmin: 2.26924785937123435371665897571e17      ymin: -4.3082129472e-7
xmax: 2.26924785960556779277434498666e17      ymax: 4.3107224573e-7

```

```

E1(MT): 0.035080      E2(WBTI): 0.040058      E3(IP): 0.027909      E4(ZS1):
0.003993      E5(ZS2): 0.018924
pd: 62773.900000      ts1: 34275.840000      ts2: 2726.700000      fft:
31385.800000      ip: 89986.000000

```

```

-0.697385 < f(x) < 0.901815
for x in [152787539231510144.000000, 335103853281388672.000000]

```

```

./psi-bounds6 -x 1600000000000000000 -c 30 -e 5e-10 -a .12 -z .5 -s 4000000 -v
user 217773.80
sys 873.71
eval 61:00:58
exit[0]

```

```

/home/buethe/usbdisk1/ZetaZeros/emz/zeros.RS0-RS20 Sat Apr 12 00:17:49 2014
Parameters:

```

```

psi_params: c: 30.000000      eps: 3.5e-10

```

```

grid_params: x0:3200000000000000000      s: 5600000      a: 0.120000

```

```

bi_params: c: 30      b: 2147483648      l: 1879048192      e: 268435456      t:
1610612736

```

```

fft_params: size: 268435456      bits: 28

```

```

executing prepare_data...
T0: 0      T1: 3221225472      Tm: 1610612736

```

```

coeff_shift: 0

```

```

Nzeros: 9769079475

```

```

executing trigsum...
csum: 32.0068      D: 17      r: 28

```

```

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

```

```

executing trigs_interpol...

```

```

fft-bits: 12

```

```

round 1

```

```

q0: 85
error <= 0.00488199

```

```

xmin: 4.34824163200898467627140083525e17      ymin: -6.2739286064e-1
xmax: 3.90665759277409818113361935576e17      ymax: 5.5313763726e-1

```

```

executing prepare_data...

```

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 2

q0: 85

error <= 0.000655356

xmin: 4.99472182284945737101290495520e17

ymin: -2.0195825097e-4

xmax: 4.37795669011448229074416039289e17

ymax: 2.0013255139e-4

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 3

q0: 85

error <= 0.000336465

xmin: 6.07578983518038027967498552176e17

ymin: -1.1189745541e-4

xmax: 6.07578983280646437817813165999e17

ymax: 1.1337355578e-4

executing prepare_data...

T0: 9663676416 T1: 12884901888 Tm: 11274289152

coeff_shift: -5

Nzeros: 10922257807

executing trigsum...

csum: 0.975133 D: 16 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 4

q0: 85

error <= 0.000171363

xmin: 3.75069971798879024583723956199e17

ymin: -6.5738976189e-5

xmax: 6.38589497402704052991075597010e17

ymax: 6.7434673008e-5

executing prepare_data...

T0: 12884901888 T1: 16106127360 Tm: 14495514624

coeff_shift: -5

Nzeros: 11051795925

executing trigsum...

csum: 0.765442 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 5

q0: 85

error <= 0.000173385

xmin: 4.66372156754204538294922583953e17

ymin: -4.3441238014e-5

xmax: 4.66372156650500370819505967789e17

ymax: 4.3023217817e-5

executing prepare_data...

T0: 16106127360 T1: 19327352832 Tm: 17716740096

coeff_shift: -5

Nzeros: 11155025460

executing trigsum...

csum: 0.631295 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 6

q0: 85

error <= 0.000174997

xmin: 3.75434659960357493193417078057e17

ymin: -3.0025999577e-5

xmax: 3.75434660031050483015061113672e17

ymax: 3.0154575954e-5

executing prepare_data...

T0: 19327352832 T1: 22548578304 Tm: 20937965568

coeff_shift: -5

Nzeros: 11240871162

executing trigsum...

csum: 0.53788 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 7

q0: 85

error <= 0.000176338

xmin: 4.75124059619845771177082566625e17

ymin: -2.0285933504e-5

xmax: 4.75124059689891340928484924318e17

ymax: 2.0241230558e-5

executing prepare_data...

T0: 22548578304 T1: 25769803776 Tm: 24159191040

coeff_shift: -6

Nzeros: 11314361469

executing trigsum...

csum: 0.468989 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 8

q0: 85

error <= 8.91526e-05

xmin: 5.86948247850354274470773063279e17

ymin: -1.2888802623e-5

xmax: 5.86948247926922432738458422899e17

ymax: 1.2963254428e-5

executing prepare_data...

T0: 25769803776 T1: 28991029248 Tm: 27380416512

coeff_shift: -6

Nzeros: 11378613650

executing trigsum...

csum: 0.416034 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 9

q0: 85

error <= 8.96542e-05

xmin: 6.14729307209647032980017120153e17

ymin: -7.7668867318e-6

xmax: 6.14729307280500863443741594253e17

ymax: 7.7523966970e-6

executing prepare_data...

T0: 28991029248 T1: 32212254720 Tm: 30601641984

coeff_shift: -6

Nzeros: 11435695215

executing trigsum...

csum: 0.374026 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 10

q0: 85

error <= 9.00998e-05

xmin: 6.14772688065946219269375018692e17

ymin: -4.8168432085e-6

xmax: 6.14772688131354370546406737033e17

ymax: 4.8329014535e-6

executing prepare_data...

T0: 32212254720 T1: 35433480192 Tm: 33822867456

coeff_shift: -6

Nzeros: 11487048401

executing trigsum...

csum: 0.339869 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 11

q0: 85

error <= 9.05007e-05

xmin: 3.18305834138714213909879530483e17

ymin: -2.9700633928e-6

xmax: 3.18305834227659619669065822620e17

ymax: 2.9673718571e-6

executing prepare_data...

T0: 35433480192 T1: 38654705664 Tm: 37044092928

coeff_shift: -6

Nzeros: 11533719533

executing trigsum...

csum: 0.311539 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 12

q0: 85

error <= 9.08651e-05

xmin: 4.41763310502320605120056998886e17

ymin: -1.5538479240e-6

xmax: 4.05068443423358413313328933583e17

ymax: 1.5564921047e-6

executing prepare_data...

T0: 38654705664 T1: 41875931136 Tm: 40265318400

coeff_shift: -6

Nzeros: 11576491949

executing trigsum...

csum: 0.287652 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 13

q0: 85

error <= 9.1199e-05

xmin: 3.31062709217690668552553309754e17

ymin: -8.6047349939e-7

xmax: 3.31062709244899523760734680347e17

ymax: 8.5649900850e-7

executing prepare_data...

T0: 41875931136 T1: 42857142858 Tm: 42366536997

coeff_shift: -8

Nzeros: 3534276488

executing trigsum...

csum: 0.083425 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 14

q0: 85

error <= 7.71815e-06

xmin: 6.32996724746976139474675181502e17

ymin: -2.8998443140e-7

xmax: 6.32996724889441116836745426675e17

ymax: 2.9151490113e-7

E1(MT): 0.034728 E2(WBTI): 0.039506 E3(IP): 0.027475 E4(ZS1):

0.005728 E5(ZS2): 0.019196

pd: 91083.230000

ts1: 56270.030000

ts2: 3881.670000

fft:

44179.920000 ip: 174644.170000

-0.769337 < f(x) < 0.694341

for x in [305575078457520448.000000, 670207706574842368.000000]

./psi-bounds6 -x 320000000000000000 -c 30 -e 3.5e-10 -a .12 -z .5 -s 5600000 -v

user 365457.00

sys 1056.71

eval 102:23:10

exit[0]

/home/buethe/usbdisk1/ZetaZeros/emz/zeros.RS0-RS20 Wed Apr 16 09:56:26 2014

Parameters:

psi_params: c: 31.000000 eps: 2.5e-10

grid_params: x0:640000000000000000 s: 8000000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 3221225472 Tm: 1610612736

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
2
3

4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 117

error <= 0.00488199

xmin: 1.32500652515292708942579632403e18

ymin: -7.8373837238e-1

xmax: 8.78936317948526558376898921551e17

ymax: 6.6927046008e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 2

q0: 117

error <= 0.000655356

xmin: 1.14525314070537552287517160127e18

ymin: -2.0234719821e-4

xmax: 8.68045853026134019228328335018e17

ymax: 2.0986977164e-4

executing prepare_data...

T0: 6442450944 T1: 9663676416 Tm: 8053063680

coeff_shift: -4

Nzeros: 10748052185

executing trigsum...

csum: 1.35201 D: 16 r: 28

0
1

2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12
round 3

q0: 117

error <= 0.000336465

xmin: 7.33966332282626337820173783975e17

ymin: -1.1959192575e-4

xmax: 7.33966332572612519129850144471e17

ymax: 1.1514206460e-4

executing prepare_data...

T0: 9663676416 T1: 12884901888 Tm: 11274289152

coeff_shift: -5

Nzeros: 10922257807

executing trigsum...

csum: 0.975133 D: 16 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12
round 4

q0: 117

error <= 0.000171363

xmin: 8.42439696959892998646962161416e17

ymin: -7.8567661031e-5

xmax: 8.42439696716548870245010999754e17

ymax: 7.9853808496e-5

executing prepare_data...

T0: 12884901888 T1: 16106127360 Tm: 14495514624

coeff_shift: -5

Nzeros: 11051795925

executing trigsum...

csum: 0.765442 D: 15 r: 28

0

1
2
3
4
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6
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8
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10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 5

q0: 117

error <= 0.000173385

xmin: 1.30507534990976867031618952493e18 ymin: -5.2689595415e-5
xmax: 9.88862370752083033501933151527e17 ymax: 5.3298285503e-5

executing prepare_data...

T0: 16106127360 T1: 19327352832 Tm: 17716740096

coeff_shift: -5

Nzeros: 11155025460

executing trigsum...

csum: 0.631295 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 6

q0: 117

error <= 0.000174997

xmin: 1.01765000870538136416694263814e18 ymin: -3.9483644537e-5
xmax: 1.32562397076721508226742787516e18 ymax: 3.9861434025e-5

executing prepare_data...

T0: 19327352832 T1: 22548578304 Tm: 20937965568

coeff_shift: -5

Nzeros: 11240871162

executing trigsum...

csum: 0.53788 D: 15 r: 28

0
1

2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 7

q0: 117

error <= 0.000176338

xmin: 8.93583191968213005300417883518e17

ymin: -3.2041100083e-5

xmax: 8.93583191828980448367643729878e17

ymax: 3.2402495414e-5

executing prepare_data...

T0: 22548578304 T1: 25769803776 Tm: 24159191040

coeff_shift: -6

Nzeros: 11314361469

executing trigsum...

csum: 0.468989 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 8

q0: 117

error <= 8.91526e-05

xmin: 7.32353321478659839590066758516e17

ymin: -2.2299923381e-5

xmax: 7.32353321572502722609435634156e17

ymax: 2.2310207894e-5

executing prepare_data...

T0: 25769803776 T1: 28991029248 Tm: 27380416512

coeff_shift: -6

Nzeros: 11378613650

executing trigsum...

csum: 0.416034 D: 15 r: 28

0
1
2

3
4
5
6
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10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 9

q0: 117

error <= 8.96542e-05

xmin: 8.66551303806333366596762761465e17

ymin: -1.7993053209e-5

xmax: 8.66551303900819843790794599068e17

ymax: 1.8003127736e-5

executing prepare_data...

T0: 28991029248 T1: 32212254720 Tm: 30601641984

coeff_shift: -6

Nzeros: 11435695215

executing trigsum...

csum: 0.374026 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 10

q0: 117

error <= 9.00998e-05

xmin: 8.96495566537978222206028307916e17

ymin: -1.3065053913e-5

xmax: 8.96495566444853992227106649372e17

ymax: 1.3127253749e-5

executing prepare_data...

T0: 32212254720 T1: 35433480192 Tm: 33822867456

coeff_shift: -6

Nzeros: 11487048401

executing trigsum...

csum: 0.339869 D: 15 r: 28

0
1
2
3

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6
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10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 11

q0: 117

error <= 9.05007e-05

xmin: 9.60028774791511925796847417731e17

ymin: -9.3600863786e-6

xmax: 6.14195284012087651165649202765e17

ymax: 9.3762893316e-6

executing prepare_data...

T0: 35433480192 T1: 38654705664 Tm: 37044092928

coeff_shift: -6

Nzeros: 11533719533

executing trigsum...

csum: 0.311539 D: 15 r: 28

0
1
2
3
4
5
6
7
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9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 12

q0: 117

error <= 9.08651e-05

xmin: 8.82811476518921249930537440905e17

ymin: -7.0799083977e-6

xmax: 8.82811476597192817787587014266e17

ymax: 7.0626446562e-6

executing prepare_data...

T0: 38654705664 T1: 41875931136 Tm: 40265318400

coeff_shift: -6

Nzeros: 11576491949

executing trigsum...

csum: 0.287652 D: 15 r: 28

0
1
2
3
4

5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 13

q0: 117

error <= 9.1199e-05

xmin: 7.59332680703479056164101135947e17

ymin: -4.9851288980e-6

xmax: 7.59332680766505524636476642690e17

ymax: 4.9163945260e-6

executing prepare_data...

T0: 41875931136 T1: 45097156608 Tm: 43486543872

coeff_shift: -6

Nzeros: 11615967392

executing trigsum...

csum: 0.267233 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 14

q0: 117

error <= 9.15072e-05

xmin: 1.15813888229343942209869951862e18

ymin: -3.4369184641e-6

xmax: 1.15813888220755515757975186990e18

ymax: 3.4398544922e-6

executing prepare_data...

T0: 45097156608 T1: 48318382080 Tm: 46707769344

coeff_shift: -7

Nzeros: 11652618162

executing trigsum...

csum: 0.249574 D: 15 r: 28

0
1
2
3
4
5

6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 15

q0: 117

error <= 4.63067e-05

xmin: 6.29165218097182899231135938330e17

ymin: -2.4214750289e-6

xmax: 6.29165218051542378287315264794e17

ymax: 2.4358103162e-6

executing prepare_data...

T0: 48318382080 T1: 51539607552 Tm: 49928994816

coeff_shift: -7

Nzeros: 11686821789

executing trigsum...

csum: 0.234147 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 16

q0: 117

error <= 4.64402e-05

xmin: 6.40140726445059623207836399970e17

ymin: -1.6091042706e-6

xmax: 6.40140726483756872878084183789e17

ymax: 1.6101392778e-6

executing prepare_data...

T0: 51539607552 T1: 54760833024 Tm: 53150220288

coeff_shift: -7

Nzeros: 11718884804

executing trigsum...

csum: 0.220551 D: 15 r: 28

0
1
2
3
4
5
6

7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 17

q0: 117

error <= 4.65654e-05

xmin: 1.02645701546903160065842574272e18
xmax: 1.02645701540678817991335928016e18

ymin: -1.0513862256e-6
ymax: 1.0519641191e-6

executing prepare_data...

T0: 54760833024 T1: 57982058496 Tm: 56371445760

coeff_shift: -7

Nzeros: 11749059511

executing trigsum...

csum: 0.208476 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 18

q0: 117

error <= 4.66832e-05

xmin: 7.89373175474143403065287591452e17
xmax: 7.89373175605897771698592501848e17

ymin: -6.7580796408e-7
ymax: 6.7934729754e-7

executing prepare_data...

T0: 57982058496 T1: 61203283968 Tm: 59592671232

coeff_shift: -7

Nzeros: 11777556069

executing trigsum...

csum: 0.19768 D: 15 r: 28

0
1
2
3
4
5
6
7

8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 19

q0: 117

error <= 4.67944e-05

xmin: 8.46202431770242238893323675929e17

ymin: -4.2566123164e-7

xmax: 8.46202431722933009487390513365e17

ymax: 4.2825347100e-7

executing prepare_data...

T0: 61203283968 T1: 62000000000 Tm: 61601641984

coeff_shift: -9

Nzeros: 2917199503

executing trigsum...

csum: 0.0473565 D: 14 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14

executing trigs_interpol...

fft-bits: 12

round 20

q0: 117

error <= 3.66688e-06

xmin: 1.12477764859676994159536718657e18

ymin: -1.4695560246e-7

xmax: 1.12477764842356388294682762562e18

ymax: 1.4720183719e-7

E1(MT): 0.035080 E2(WBTI): 0.038435 E3(IP): 0.027569 E4(ZS1):
0.003046 E5(ZS2): 0.016486
pd: 142960.930000 ts1: 78403.880000 ts2: 5731.100000 fft:
56846.970000 ip: 371964.400000

-0.921602 < f(x) < 0.805995

for x in [611150156907708160.000000, 1340415413165772032.000000]

```
./psi-bounds6 -x 640000000000000000 -c 31 -e 2.5e-10 -a .12 -z .5 -s 8000000 -v
user 648674.59
sys 1990.47
eval 181:51:06
exit[0]
```

Parameters:

psi_params: c: 31.000000 eps: 1.9e-10

grid_params: x0:1280000000000000000 s: 11000000 a: 0.120000

bi_params: c: 30 b: 2147483648 l: 1879048192 e: 268435456 t:
1610612736

fft_params: size: 268435456 bits: 28

executing prepare_data...

T0: 0 T1: 3221225472 Tm: 1610612736

coeff_shift: 0

Nzeros: 9769079475

executing trigsum...

csum: 32.0068 D: 17 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 165

error <= 0.00488199

xmin: 1.32500652515200757758393307053e18

ymin: -7.8373853375e-1

xmax: 2.31820322899043243076947846903e18

ymax: 5.9358210068e-1

executing prepare_data...

T0: 3221225472 T1: 6442450944 Tm: 4831838208

coeff_shift: -3

Nzeros: 10479796488

executing trigsum...

csum: 2.25067 D: 16 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

```
    fft-bits: 12
    round 2
q0: 165
    error <= 0.000655356

    xmin: 2.09911351823689103024642526573e18    ymin: -2.1103686521e-4
    xmax: 2.09911351682538620184228356110e18    ymax: 1.9968826576e-4
```

```
executing prepare_data...
    T0: 6442450944 T1: 9663676416 Tm: 8053063680
```

```
    coeff_shift: -4
```

```
Nzeros: 10748052185
```

```
executing trigsum...
    csum: 1.35201 D: 16 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
```

```
executing trigs_interpol...
    fft-bits: 12
    round 3
q0: 165
    error <= 0.000336465

    xmin: 2.18466350598592285886145655162e18    ymin: -1.1362966206e-4
    xmax: 1.94058627163967687789598248073e18    ymax: 1.1379977260e-4
```

```
executing prepare_data...
    T0: 9663676416 T1: 12884901888 Tm: 11274289152
```

```
    coeff_shift: -5
```

```
Nzeros: 10922257807
```

```
executing trigsum...
    csum: 0.975133 D: 16 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
```

executing trigs_interpol...

fft-bits: 12
round 4

q0: 165

error <= 0.000171363

xmin: 1.89169063246079790606655601806e18 ymin: -7.7080712865e-5
xmax: 1.61409190629354759266451951717e18 ymax: 7.6571024219e-5

executing prepare_data...

T0: 12884901888 T1: 16106127360 Tm: 14495514624

coeff_shift: -5

Nzeros: 11051795925

executing trigsum...

csum: 0.765442 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 5

q0: 165

error <= 0.000173385

xmin: 1.61842130886675795814323274082e18 ymin: -6.0621089549e-5
xmax: 1.61842130922029364667148116387e18 ymax: 6.0200087122e-5

executing prepare_data...

T0: 16106127360 T1: 19327352832 Tm: 17716740096

coeff_shift: -5

Nzeros: 11155025460

executing trigsum...

csum: 0.631295 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

```
    fft-bits: 12
    round 6
q0: 165
    error <= 0.000174997

    xmin: 1.58955605901406491832248796049e18    ymin: -4.6855023558e-5
    xmax: 1.58955605873544672611073734553e18    ymax: 4.6713521521e-5
```

```
executing prepare_data...
    T0: 19327352832 T1: 22548578304 Tm: 20937965568
```

```
    coeff_shift: -5
```

```
Nzeros: 11240871162
```

```
executing trigsum...
    csum: 0.53788    D: 15    r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

```
executing trigs_interpol...
    fft-bits: 12
    round 7
q0: 165
    error <= 0.000176338

    xmin: 1.64302010300163218269021506756e18    ymin: -3.6535778218e-5
    xmax: 1.64302010324090496050026452769e18    ymax: 3.6702940207e-5
```

```
executing prepare_data...
    T0: 22548578304 T1: 25769803776 Tm: 24159191040
```

```
    coeff_shift: -6
```

```
Nzeros: 11314361469
```

```
executing trigsum...
    csum: 0.468989    D: 15    r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

```
executing trigs_interpol...
    fft-bits: 12
```

```
round 8
q0: 165
error <= 8.91526e-05

xmin: 1.51138705414072543875034406477e18    ymin: -2.9833659790e-5
xmax: 1.51138705393580020228041616183e18    ymax: 2.9696469503e-5
```

```
executing prepare_data...
T0: 25769803776 T1: 28991029248 Tm: 27380416512
```

```
coeff_shift: -6
```

```
Nzeros: 11378613650
```

```
executing trigsum...
csum: 0.416034 D: 15 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

```
executing trigs_interpol...
```

```
fft-bits: 12
round 9
```

```
q0: 165
error <= 8.96542e-05
```

```
xmin: 1.42136740160796716018945821282e18    ymin: -2.4102232027e-5
xmax: 1.42136740144636010819657697305e18    ymax: 2.4092672654e-5
```

```
executing prepare_data...
T0: 28991029248 T1: 32212254720 Tm: 30601641984
```

```
coeff_shift: -6
```

```
Nzeros: 11435695215
```

```
executing trigsum...
csum: 0.374026 D: 15 r: 28
```

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

```
executing trigs_interpol...
```

```
fft-bits: 12
round 10
```


q0: 165

error <= 9.00998e-05

xmin: 1.47769090653131325547814795700e18

ymin: -1.8937647815e-5

xmax: 1.47769090668188226244236987576e18

ymax: 1.8930159612e-5

executing prepare_data...

T0: 32212254720 T1: 35433480192 Tm: 33822867456

coeff_shift: -6

Nzeros: 11487048401

executing trigsum...

csum: 0.339869 D: 15 r: 28

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

executing trigs_interpol...

fft-bits: 12

round 11

q0: 165

error <= 9.05007e-05

xmin: 2.17823664540428744494725794338e18

ymin: -1.4876168847e-5

xmax: 1.85864176762623232775328656113e18

ymax: 1.4910600343e-5

executing prepare_data...

T0: 35433480192 T1: 38654705664 Tm: 37044092928

coeff_shift: -6

Nzeros: 11533719533

executing trigsum...

csum: 0.311539 D: 15 r: 28

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

executing trigs_interpol...

fft-bits: 12

round 12

q0: 165

error <= 9.08651e-05

xmin: 2.25519177675728361476390891536e18 ymin: -1.2302207133e-5
xmax: 2.25519177695198818789949902931e18 ymax: 1.2288506615e-5

executing prepare_data...

T0: 38654705664 T1: 41875931136 Tm: 40265318400

coeff_shift: -6

Nzeros: 11576491949

executing trigsum...

csum: 0.287652 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 13

q0: 165

error <= 9.1199e-05

xmin: 2.48168767451470948701455329697e18 ymin: -9.8327179812e-6
xmax: 2.48168767470005062222992690278e18 ymax: 9.8322785852e-6

executing prepare_data...

T0: 41875931136 T1: 45097156608 Tm: 43486543872

coeff_shift: -6

Nzeros: 11615967392

executing trigsum...

csum: 0.267233 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 14

q0: 165

error <= 9.15072e-05

xmin: 1.77197045252583683538583190920e18 ymin: -8.1469215171e-6
xmax: 1.77197045239676226555183136707e18 ymax: 8.1304905502e-6

executing prepare_data...

T0: 45097156608 T1: 48318382080 Tm: 46707769344

coeff_shift: -7

Nzeros: 11652618162

executing trigsum...

csum: 0.249574 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 15

q0: 165

error <= 4.63067e-05

xmin: 1.23446666505266480966865536191e18 ymin: -6.0091791082e-6
xmax: 1.23446666529844139465666121657e18 ymax: 6.0093783975e-6

executing prepare_data...

T0: 48318382080 T1: 51539607552 Tm: 49928994816

coeff_shift: -7

Nzeros: 11686821789

executing trigsum...

csum: 0.234147 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 16

q0: 165

error <= 4.64402e-05

xmin: 1.45016011386693856625457328124e18 ymin: -4.7410577851e-6
xmax: 1.45016011378078768510350519995e18 ymax: 4.7578915037e-6

executing prepare_data...

T0: 51539607552 T1: 54760833024 Tm: 53150220288

coeff_shift: -7

Nzeros: 11718884804

executing trigsum...

csum: 0.220551 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 17

q0: 165

error <= 4.65654e-05

xmin: 1.61915536129419155456312449904e18 ymin: -3.7043125476e-6
xmax: 1.61915536139065411049638979275e18 ymax: 3.7074035852e-6

executing prepare_data...

T0: 54760833024 T1: 57982058496 Tm: 56371445760

coeff_shift: -7

Nzeros: 11749059511

executing trigsum...

csum: 0.208476 D: 15 r: 28

0
1
2
3
4
5
6
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8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 18

q0: 165

error <= 4.66832e-05

xmin: 2.03324485083622086523947379529e18 ymin: -2.9403947882e-6

xmax: 2.03324485072726589630960307292e18

ymax: 2.9373832852e-6

executing prepare_data...

T0: 57982058496 T1: 61203283968 Tm: 59592671232

coeff_shift: -7

Nzeros: 11777556069

executing trigsum...

csum: 0.19768 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 19

q0: 165

error <= 4.67944e-05

xmin: 2.62664944163657589652554745344e18

ymin: -2.1606505106e-6

xmax: 2.42614061155583403451041929031e18

ymax: 2.1554413208e-6

executing prepare_data...

T0: 61203283968 T1: 64424509440 Tm: 62813896704

coeff_shift: -7

Nzeros: 11804551378

executing trigsum...

csum: 0.187968 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 20

q0: 165

error <= 4.68998e-05

xmin: 2.15233016330255581528521310638e18

ymin: -1.5562726844e-6

xmax: 2.15233016319360485651816625775e18

ymax: 1.5555178028e-6

executing prepare_data...

T0: 64424509440 T1: 67645734912 Tm: 66035122176

coeff_shift: -7

Nzeros: 11830195768

executing trigsum...

csum: 0.179184 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 21

q0: 165

error <= 4.69999e-05

xmin: 1.94054774217351118945858387909e18

ymin: -1.2269731356e-6

xmax: 1.94054774227140299551990457689e18

ymax: 1.2203909665e-6

executing prepare_data...

T0: 67645734912 T1: 70866960384 Tm: 69256347648

coeff_shift: -7

Nzeros: 11854618048

executing trigsum...

csum: 0.1712 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 22

q0: 165

error <= 4.70952e-05

xmin: 1.64879609001352335608701234802e18

ymin: -9.0275215175e-7

xmax: 1.64879609008856502392756672540e18

ymax: 9.0255038700e-7

executing prepare_data...

T0: 70866960384 T1: 74088185856 Tm: 72477573120

coeff_shift: -7

Nzeros: 11877929441

executing trigsum...

csum: 0.16391 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 23

q0: 165

error <= 4.71862e-05

xmin: 1.45349233769320649608702504146e18

ymin: -6.1929807505e-7

xmax: 1.45349233762844486505635573159e18

ymax: 6.1793383222e-7

executing prepare_data...

T0: 74088185856 T1: 77309411328 Tm: 75698798592

coeff_shift: -7

Nzeros: 11900226641

executing trigsum...

csum: 0.157228 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 24

q0: 165

error <= 4.72732e-05

xmin: 1.35334461885022274529272659217e18

ymin: -4.4857549975e-7

xmax: 1.35334461879671376393175971282e18

ymax: 4.5132253901e-7

executing prepare_data...

T0: 77309411328 T1: 80530636800 Tm: 78920024064

coeff_shift: -7

Nzeros: 11921594241

executing trigsum...

csum: 0.151079 D: 15 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 25

q0: 165

error <= 4.73567e-05

xmin: 2.59437578743671740423419141448e18

ymin: -3.1544152944e-7

xmax: 2.59437578753459199791709012339e18

ymax: 3.1844027105e-7

executing prepare_data...

T0: 80530636800 T1: 81578947368 Tm: 81054792084

coeff_shift: -9

Nzeros: 3884208488

executing trigsum...

csum: 0.0479214 D: 14 r: 28

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14

executing trigs_interpol...

fft-bits: 12

round 26

q0: 165

error <= 4.61058e-06

xmin: 1.36925145436170983245822176212e18

ymin: -1.2881242499e-7

xmax: 1.36925145441584774347682168551e18

ymax: 1.2895289881e-7

E1(MT): 0.037704

E2(WBTI): 0.040967

E3(IP): 0.026699

E4(ZS1):

0.004354

E5(ZS2): 0.016663

pd: 187892.020000

ts1: 117015.290000

ts2: 7909.560000

fft:

75522.380000 ip: 712679.100000

-0.927801 < f(x) < 0.735730

for x in [1222300313806618112.000000, 2680830826350851072.000000]

./psi-bounds6 -x 1280000000000000000 -c 31 -e 1.9e-10 -s 11000000 -a .12 -z .5

-v

user 1090869.59

sys 2904.44

eval 306:16:51

exit[0]

Parameters:

psi_params: c: 31.000000 eps: 1.9e-10

grid_params: x0:2560000000000000000 s: 17000000 a: 0.120000

bi_params: c: 30 b: 4294967296 l: 3758096384 e: 536870912 t:
3221225472

fft_params: size: 536870912 bits: 29

executing prepare_data...

T0: 0 T1: 6442450944 Tm: 3221225472

coeff_shift: 0

Nzeros: 12500000000

executing trigsum...

csum: 34.2575 D: 17 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

executing prepare_data...

T0: 0 T1: 6442450944 Tm: 3221225472

coeff_shift: 0

Nzeros: 7748875963

executing trigsum...

csum: 34.2575 D: 17 r: 29

0
1
2
3
4
5
6
7
8

9
10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 109

error <= 0.011119

xmin: 3.34044725745938963938189625122e18

ymin: -6.1985392429e-1

xmax: 3.87720528032380395458965092359e18

ymax: 6.5688415874e-1

executing prepare_data...

T0: 6442450944 T1: 12884901888 Tm: 9663676416

coeff_shift: -3

Nzeros: 12500000000

executing trigsum...

csum: 2.32714 D: 16 r: 29

0
1
2
3
4
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11
12
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14
15
16

executing prepare_data...

T0: 6442450944 T1: 12884901888 Tm: 9663676416

coeff_shift: -3

Nzeros: 9170309992

executing trigsum...

csum: 2.32714 D: 16 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

```
16
executing trigs_interpol...
  fft-bits: 12
  round 2
q0: 109
  error <= 0.00148822

  xmin: 3.88544699053651011174945933783e18      ymin: -1.3732499095e-4
  xmax: 2.72981972479454676221538961048e18      ymax: 1.3944926510e-4
```

```
executing prepare_data...
  T0: 12884901888 T1: 19327352832 Tm: 16106127360

  coeff_shift: -4
```

Nzeros: 12500000000

```
executing trigsum...
  csum: 1.39674   D: 16   r: 29
```

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

```
executing prepare_data...
  T0: 12884901888 T1: 19327352832 Tm: 16106127360

  coeff_shift: -4
```

Nzeros: 9706821385

```
executing trigsum...
  csum: 1.39674   D: 16   r: 29
```

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

```
executing trigs_interpol...
  fft-bits: 12
  round 3
q0: 109
  error <= 0.000762972

  xmin: 4.84985959319062100076634968695e18      ymin: -7.4385685249e-5
```

xmax: 4.03383390206782543132853977404e18

ymax: 7.4049098298e-5

executing prepare_data...

T0: 19327352832 T1: 25769803776 Tm: 22548578304

coeff_shift: -4

Nzeros: 12500000000

executing trigsum...

csum: 1.00687 D: 16 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing prepare_data...

T0: 19327352832 T1: 25769803776 Tm: 22548578304

coeff_shift: -4

Nzeros: 10055232631

executing trigsum...

csum: 1.00687 D: 16 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 4

q0: 109

error <= 0.000774929

xmin: 2.59563841118161374155404322033e18

ymin: -4.7495299843e-5

xmax: 3.15521986046360128562678244955e18

ymax: 4.7346008799e-5

executing prepare_data...

T0: 25769803776 T1: 32212254720 Tm: 28991029248

coeff_shift: -5

Nzeros: 12500000000

executing trigsum...

csum: 0.790059 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing prepare_data...

T0: 25769803776 T1: 32212254720 Tm: 28991029248

coeff_shift: -5

Nzeros: 10314308865

executing trigsum...

csum: 0.790059 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 5

q0: 109

error <= 0.00039236

xmin: 5.07048306108621662849561488971e18

ymin: -3.1179290113e-5

xmax: 5.07048306164002690961742075689e18

ymax: 3.1004318259e-5

executing prepare_data...

T0: 32212254720 T1: 38654705664 Tm: 35433480192

coeff_shift: -5

Nzeros: 12500000000

executing trigsum...

csum: 0.651408 D: 15 r: 29

0
1
2
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9
10
11
12
13
14
15
executing prepare_data...
T0: 32212254720 T1: 38654705664 Tm: 35433480192

coeff_shift: -5

Nzeros: 10520767934

executing trigsum...
csum: 0.651408 D: 15 r: 29

0
1
2
3
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14
15

executing trigs_interpol...
fft-bits: 12
round 6

q0: 109
error <= 0.000395903

xmin: 5.16930232651297370965357729653e18 ymin: -2.0794911024e-5
xmax: 5.16930232604243272465654560051e18 ymax: 2.1025319432e-5

executing prepare_data...
T0: 38654705664 T1: 45097156608 Tm: 41875931136

coeff_shift: -5

Nzeros: 12500000000

executing trigsum...
csum: 0.554885 D: 15 r: 29

0
1
2
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4
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9
10
11
12
13
14
15

executing prepare_data...

T0: 38654705664 T1: 45097156608 Tm: 41875931136

coeff_shift: -5

Nzeros: 10692459341

executing trigsum...

csum: 0.554885 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 7

q0: 109

error <= 0.000398849

xmin: 2.87893704725398128810718694546e18

ymin: -1.2608908019e-5

xmax: 2.87893704704176641322548048307e18

ymax: 1.2537597532e-5

executing prepare_data...

T0: 45097156608 T1: 51539607552 Tm: 48318382080

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.48372 D: 15 r: 29

0
1
2
3
4
5
6
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8
9
10
11
12
13
14
15

executing prepare_data...

T0: 45097156608 T1: 51539607552 Tm: 48318382080

coeff_shift: -6

Nzeros: 10839439951

executing trigsum...

csum: 0.48372 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 8

q0: 109

error <= 0.000201136

xmin: 3.05545031878462026940761412327e18

ymin: -7.6507428596e-6

xmax: 3.05545031857254597871612671789e18

ymax: 7.6662143267e-6

executing prepare_data...

T0: 51539607552 T1: 57982058496 Tm: 54760833024

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.429027 D: 15 r: 29

0
1
2
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11
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13
14
15

executing prepare_data...

T0: 51539607552 T1: 57982058496 Tm: 54760833024

coeff_shift: -6

Nzeros: 10967944315

executing trigsum...

csum: 0.429027 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9


```
10
11
12
13
14
15
executing trigs_interpol...
  fft-bits: 12
  round 9
q0: 109
  error <= 0.000202238

  xmin: 3.76101163910656482450704924130e18      ymin: -4.7396113283e-6
  xmax: 3.76101163888981732450910785968e18      ymax: 4.7150398982e-6

executing prepare_data...
  T0: 57982058496 T1: 64424509440 Tm: 61203283968

  coeff_shift: -6

Nzeros: 12500000000

executing trigsum...
  csum: 0.385649 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
executing prepare_data...
  T0: 57982058496 T1: 64424509440 Tm: 61203283968

  coeff_shift: -6

Nzeros: 11082107447

executing trigsum...
  csum: 0.385649 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
executing trigs_interpol...
  fft-bits: 12
  round 10
q0: 109
```

error <= 0.000203218

xmin: 2.81438149726885981220572501506e18 ymin: -2.6926651060e-6
xmax: 2.81438149741707935688477337261e18 ymax: 2.7016847128e-6

executing prepare_data...

T0: 64424509440 T1: 70866960384 Tm: 67645734912

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.350384 D: 15 r: 29

0
1
2
3
4
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10
11
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13
14
15

executing prepare_data...

T0: 64424509440 T1: 70866960384 Tm: 67645734912

coeff_shift: -6

Nzeros: 11184813816

executing trigsum...

csum: 0.350384 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 11

q0: 109

error <= 0.000204099

xmin: 4.04020943649311023332936103802e18 ymin: -1.5394789970e-6
xmax: 4.04020943669346601057743244237e18 ymax: 1.5368350505e-6

executing prepare_data...

T0: 70866960384 T1: 77309411328 Tm: 74088185856

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.321138 D: 15 r: 29

0
1
2
3
4
5
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9
10
11
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13
14
15

executing prepare_data...

T0: 70866960384 T1: 77309411328 Tm: 74088185856

coeff_shift: -6

Nzeros: 11278156082

executing trigsum...

csum: 0.321138 D: 15 r: 29

0
1
2
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5
6
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8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12

round 12

q0: 109

error <= 0.0002049

xmin: 3.15894453791757343103260634616e18

ymin: -7.5752230294e-7

xmax: 3.15894453778647337214392641776e18

ymax: 7.5607317772e-7

executing prepare_data...

T0: 77309411328 T1: 81578947368 Tm: 79444179348

coeff_shift: -7

Nzeros: 12500000000

executing trigsum...

csum: 0.199001 D: 15 r: 29

0
1
2
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8
9
10
11
12
13
14
15
executing prepare_data...
T0: 77309411328 T1: 81578947368 Tm: 79444179348

coeff_shift: -7

Nzeros: 3305802729

executing trigsum...
csum: 0.199001 D: 15 r: 29

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

executing trigs_interpol...

fft-bits: 12
round 13

q0: 109

error <= 6.87021e-05

xmin: 2.59437578722584836112646476251e18 ymin: -3.4386928776e-7
xmax: 2.59437578753401855613351804806e18 ymax: 3.4390636650e-7

E1(MT): 0.053322 E2(WBTI): 0.056589 E3(IP): 0.028853 E4(ZS1):
0.006157 E5(ZS2): 0.016663
pd: 224092.570000 ts1: 132062.980000 ts2: 17101.390000 fft:
186275.650000 ip: 560861.910000

-0.806344 < f(x) < 0.843746

for x in [2444600627613223424.000000, 5361677720487365632.000000]

./psi-bounds6 -x 2560000000000000000 -c 31 -e 1.9e-10 -s 17000000 -a .12 -z .5

-v
user 1100855.21
sys 3658.90
eval 308:45:54
exit[0]

Parameters:

psi_params: c: 31.000000 eps: 1.9e-10

grid_params: x0:5120000000000000000 s: 30000000 a: 0.120000

bi_params: c: 30 b: 4294967296 l: 3758096384 e: 536870912 t:
3221225472

fft_params: size: 536870912 bits: 29

executing prepare_data...

T0: 0 T1: 6442450944 Tm: 3221225472

coeff_shift: 0

Nzeros: 12500000000

executing trigsum...

csum: 34.2575 D: 17 r: 29

0
1
2
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13
14
15
16
17

executing prepare_data...

T0: 0 T1: 6442450944 Tm: 3221225472

coeff_shift: 0

Nzeros: 7748875963

executing trigsum...

csum: 34.2575 D: 17 r: 29

0
1
2
3
4
5
6
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8
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10
11
12
13
14
15
16
17

executing trigs_interpol...

fft-bits: 12

round 1

q0: 125

error <= 0.011119

xmin: 5.05653154563593761168135905592e18

ymin: -5.7414746260e-1

xmax: 5.80552342171898671088805573396e18

ymax: 6.8034632230e-1

executing prepare_data...

T0: 6442450944 T1: 12884901888 Tm: 9663676416

coeff_shift: -3

Nzeros: 12500000000

executing trigsum...

csum: 2.32714 D: 16 r: 29

0
1
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12
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14
15
16

executing prepare_data...

T0: 6442450944 T1: 12884901888 Tm: 9663676416

coeff_shift: -3

Nzeros: 9170309992

executing trigsum...

csum: 2.32714 D: 16 r: 29

0
1
2
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12
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14
15
16

executing trigs_interpol...

fft-bits: 12

round 2

q0: 125

error <= 0.00148822

xmin: 5.70030523916337357190657782325e18

ymin: -1.4774616099e-4

xmax: 6.84556789447664808012661204641e18

ymax: 1.3763964079e-4

executing prepare_data...

T0: 12884901888 T1: 19327352832 Tm: 16106127360

coeff_shift: -4

Nzeros: 12500000000

executing trigsum...

csum: 1.39674 D: 16 r: 29

0
1

2
3
4
5
6
7
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9
10
11
12
13
14
15
16

executing prepare_data...

T0: 12884901888 T1: 19327352832 Tm: 16106127360

coeff_shift: -4

Nzeros: 9706821385

executing trigsum...

csum: 1.39674 D: 16 r: 29

0
1
2
3
4
5
6
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10
11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12

round 3

q0: 125

error <= 0.000762972

xmin: 5.36707218993565604927909608782e18

ymin: -7.5312172582e-5

xmax: 9.48482798055436986411012973623e18

ymax: 7.7855902414e-5

executing prepare_data...

T0: 19327352832 T1: 25769803776 Tm: 22548578304

coeff_shift: -4

Nzeros: 12500000000

executing trigsum...

csum: 1.00687 D: 16 r: 29

0
1
2
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13
14
15
16
executing prepare_data...
T0: 19327352832 T1: 25769803776 Tm: 22548578304

coeff_shift: -4

Nzeros: 10055232631

executing trigsum...
csum: 1.00687 D: 16 r: 29

0
1
2
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11
12
13
14
15
16

executing trigs_interpol...

fft-bits: 12
round 4

q0: 125

error <= 0.000774929

xmin: 5.70098133362722283996399683956e18
xmax: 6.98677327382860258185670589869e18

ymin: -4.6298205742e-5
ymax: 4.5962924594e-5

executing prepare_data...
T0: 25769803776 T1: 32212254720 Tm: 28991029248

coeff_shift: -5

Nzeros: 12500000000

executing trigsum...
csum: 0.790059 D: 15 r: 29

0
1
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11
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14
15

executing prepare_data...
T0: 25769803776 T1: 32212254720 Tm: 28991029248

coeff_shift: -5

Nzeros: 10314308865

executing trigsum...

csum: 0.790059 D: 15 r: 29

0
1
2
3
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11
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14
15

executing trigs_interpol...

fft-bits: 12

round 5

q0: 125

error <= 0.00039236

xmin: 5.07048306108486104590869553916e18

ymin: -3.1184998692e-5

xmax: 5.07048306163112587335246130525e18

ymax: 3.0989549218e-5

executing prepare_data...

T0: 32212254720 T1: 38654705664 Tm: 35433480192

coeff_shift: -5

Nzeros: 12500000000

executing trigsum...

csum: 0.651408 D: 15 r: 29

0
1
2
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14
15

executing prepare_data...

T0: 32212254720 T1: 38654705664 Tm: 35433480192

coeff_shift: -5

Nzeros: 10520767934

executing trigsum...

csum: 0.651408 D: 15 r: 29

0
1

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3
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14
15

executing trigs_interpol...

fft-bits: 12

round 6

q0: 125

error <= 0.000395903

xmin: 5.16930232650527324107845714403e18

ymin: -2.0780618769e-5

xmax: 5.16930232603629551516842202607e18

ymax: 2.0970368850e-5

executing prepare_data...

T0: 38654705664 T1: 45097156608 Tm: 41875931136

coeff_shift: -5

Nzeros: 12500000000

executing trigsum...

csum: 0.554885 D: 15 r: 29

0
1
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10
11
12
13
14
15

executing prepare_data...

T0: 38654705664 T1: 45097156608 Tm: 41875931136

coeff_shift: -5

Nzeros: 10692459341

executing trigsum...

csum: 0.554885 D: 15 r: 29

0
1
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14
15

executing trigs_interpol...

fft-bits: 12
round 7

q0: 125

error <= 0.000398849

xmin: 7.05137704612606805581193246833e18 ymin: -1.3535898064e-5
xmax: 7.05137704667972950308123489069e18 ymax: 1.3448537311e-5

executing prepare_data...

T0: 45097156608 T1: 51539607552 Tm: 48318382080

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.48372 D: 15 r: 29

0
1
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14
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executing prepare_data...

T0: 45097156608 T1: 51539607552 Tm: 48318382080

coeff_shift: -6

Nzeros: 10839439951

executing trigsum...

csum: 0.48372 D: 15 r: 29

0
1
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executing trigs_interpol...

fft-bits: 12
round 8

q0: 125

error <= 0.000201136

xmin: 8.11538904532266194932945412388e18 ymin: -7.8919619198e-6
xmax: 8.11538904585425072642249946953e18 ymax: 7.8390392627e-6

executing prepare_data...

T0: 51539607552 T1: 57982058496 Tm: 54760833024

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.429027 D: 15 r: 29

0
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executing prepare_data...

T0: 51539607552 T1: 57982058496 Tm: 54760833024

coeff_shift: -6

Nzeros: 10967944315

executing trigsum...

csum: 0.429027 D: 15 r: 29

0
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executing trigs_interpol...

fft-bits: 12

round 9

q0: 125

error <= 0.000202238

xmin: 5.43224773369063361230287287348e18 ymin: -4.6318835736e-6
xmax: 5.43224773400967108540499660676e18 ymax: 4.6087590379e-6

executing prepare_data...

T0: 57982058496 T1: 64424509440 Tm: 61203283968

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.385649 D: 15 r: 29

0
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executing prepare_data...

T0: 57982058496 T1: 64424509440 Tm: 61203283968

coeff_shift: -6

Nzeros: 11082107447

executing trigsum...

csum: 0.385649 D: 15 r: 29

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executing trigs_interpol...

fft-bits: 12

round 10

q0: 125

error <= 0.000203218

xmin: 5.39263147462713568748172309651e18

ymin: -2.7125270762e-6

xmax: 5.39263147488626270468325707376e18

ymax: 2.7334674556e-6

executing prepare_data...

T0: 64424509440 T1: 70866960384 Tm: 67645734912

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...

csum: 0.350384 D: 15 r: 29

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executing prepare_data...
T0: 64424509440 T1: 70866960384 Tm: 67645734912

coeff_shift: -6

Nzeros: 11184813816

executing trigsum...
csum: 0.350384 D: 15 r: 29

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executing trigs_interpol...

fft-bits: 12

round 11

q0: 125

error <= 0.000204099

xmin: 5.57043873773845971496467972295e18

ymin: -1.5296655877e-6

xmax: 5.57043873799853723216929562651e18

ymax: 1.5271442704e-6

executing prepare_data...
T0: 70866960384 T1: 77309411328 Tm: 74088185856

coeff_shift: -6

Nzeros: 12500000000

executing trigsum...
csum: 0.321138 D: 15 r: 29

0
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executing prepare_data...

T0: 70866960384 T1: 77309411328 Tm: 74088185856

coeff_shift: -6

Nzeros: 11278156082

executing trigsum...

csum: 0.321138 D: 15 r: 29

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executing trigs_interpol...

fft-bits: 12

round 12

q0: 125

error <= 0.0002049

xmin: 8.54519869233037102842605085156e18

ymin: -7.8750442094e-7

xmax: 8.54519869194888738159601571758e18

ymax: 7.9098862752e-7

executing prepare_data...

T0: 77309411328 T1: 81578947368 Tm: 79444179348

coeff_shift: -7

Nzeros: 12500000000

executing trigsum...

csum: 0.199001 D: 15 r: 29

0
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executing prepare_data...

T0: 77309411328 T1: 81578947368 Tm: 79444179348

coeff_shift: -7

Nzeros: 3305802729

executing trigsum...

csum: 0.199001 D: 15 r: 29

0

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executing trigs_interpol...

fft-bits: 12

round 13

q0: 125

error <= 6.87021e-05

xmin: 7.93646066886377404403419011850e18

ymin: -3.3515327321e-7

xmax: 7.93646066853962604968393393492e18

ymax: 3.3384060255e-7

E1(MT): 0.075409

E2(WBTI): 0.078266

E3(IP): 0.035335

E4(ZS1):

0.008707

E5(ZS2): 0.016663

pd: 201851.670000

ts1: 119979.150000

ts2: 15406.130000

fft:

168868.390000 ip: 526579.470000

-0.813516 < f(x) < 0.920769

for x in [4889201255226456064.000000, 10723355440974751744.000000]

./psi-bounds6 -x 5120000000000000000 -c 31 -e 1.9e-10 -s 30000000 -a .12 -z .5

-v

user 1014682.20

sys 3675.76

eval 285:29:54

exit[0]

File NPiX/26PiX=X:

(c) 2014 Jan Büthe

#

Solutions to $26\pi(X)=X$

No	X	pi(X)
1	554805820452	21338685402
2	554805820478	21338685403
3	554805820504	21338685404
4	554805820556	21338685406

File NPiX/27PiX=X:

(c) 2014 Jan Büthe

#

Solutions to $27\pi(X)=X$

No	X	pi(X)
1	1505578023621	55762149023
2	1505578023756	55762149028
3	1505578023783	55762149029
4	1505578024809	55762149067
5	1505578024836	55762149068
6	1505578024917	55762149071
7	1505578024971	55762149073
8	1505578024998	55762149074

9	1505578025025	55762149075
10	1505578025052	55762149076
11	1505578025106	55762149078
12	1505578025457	55762149091
13	1505578025484	55762149092
14	1505578025781	55762149103
15	1505578026105	55762149115

File NPiX/28PiX=X:

(c) 2014 Jan Bütke

Solutions to $28*\pi(X)=X$

No	X	pi(X)
1	4086199301996	145935689357
2	4086199302052	145935689359
3	4086199302080	145935689360
4	4086199302136	145935689362
5	4086199302248	145935689366
6	4086199302276	145935689367
7	4086199302332	145935689369
8	4086199302976	145935689392
9	4086199303004	145935689393

File NPiX/29PiX=X:

(c) 2014 Jan Bütke

Solutions to $29*\pi(X)=X$

No	X	pi(X)
1	11091501630949	382465573481
2	11091501630978	382465573482
3	11091501631181	382465573489
4	11091501631210	382465573490
5	11091501631239	382465573491
6	11091501631268	382465573492
7	11091501631384	382465573496
8	11091501631413	382465573497
9	11091501631442	382465573498
10	11091501631848	382465573512
11	11091501632022	382465573518
12	11091501632312	382465573528
13	11091501632544	382465573536
14	11091501632631	382465573539
15	11091501633037	382465573553

File NPiX/30PiX=X:

(c) 2014 Jan Bütke

Solutions to $30*\pi(X)=X$

No	X	pi(X)
1	30109570412400	1003652347080
2	30109570412430	1003652347081
3	30109570412970	1003652347099
4	30109570413240	1003652347108
5	30109570413270	1003652347109
6	30109570413330	1003652347111
7	30109570413360	1003652347112
8	30109570419960	1003652347332
9	30109570419990	1003652347333
10	30109570420170	1003652347339

11	30109570420260	1003652347342
12	30109570420380	1003652347346
13	30109570420440	1003652347348
14	30109570420500	1003652347350
15	30109570420530	1003652347351
16	30109570420560	1003652347352
17	30109570420590	1003652347353
18	30109570420620	1003652347354
19	30109570420710	1003652347357
20	30109570420770	1003652347359
21	30109570420800	1003652347360
22	30109570420950	1003652347365
23	30109570420980	1003652347366
24	30109570421010	1003652347367
25	30109570421250	1003652347375
26	30109570421280	1003652347376

File NPiX/31PiX=X:

(c) 2014 Jan Bütke
 #
 # Solutions to $31 \cdot \pi(X) = X$

No	X	pi(X)
1	81744303089590	2636913002890
2	81744303090117	2636913002907
3	81744303090706	2636913002926
4	81744303091171	2636913002941
5	81744303091202	2636913002942
6	81744303091264	2636913002944
7	81744303091295	2636913002945
8	81744303091419	2636913002949
9	81744303091636	2636913002956
10	81744303091760	2636913002960
11	81744303092287	2636913002977
12	81744303092318	2636913002978
13	81744303092504	2636913002984
14	81744303092535	2636913002985
15	81744303092566	2636913002986
16	81744303092628	2636913002988
17	81744303092690	2636913002990
18	81744303092721	2636913002991
19	81744303097960	2636913003160
20	81744303098022	2636913003162
21	81744303098053	2636913003163
22	81744303098766	2636913003186

File NPiX/32PiX=X:

(c) 2014 Jan Bütke
 #
 # Solutions to $32 \cdot \pi(X) = X$

No	X	pi(X)
1	221945984401280	6935812012540
2	221945984401312	6935812012541
3	221945984401344	6935812012542
4	221945984401440	6935812012545
5	221945984402368	6935812012574
6	221945984402400	6935812012575
7	221945984403168	6935812012599
8	221945984403840	6935812012620
9	221945984403872	6935812012621
10	221945984403904	6935812012622
11	221945984404000	6935812012625
12	221945984404064	6935812012627
13	221945984410016	6935812012813

14	221945984410048	6935812012814
15	221945984410272	6935812012821
16	221945984410336	6935812012823
17	221945984411104	6935812012847
18	221945984411136	6935812012848
19	221945984411200	6935812012850
20	221945984411232	6935812012851
21	221945984411264	6935812012852
22	221945984411680	6935812012865
23	221945984411712	6935812012866
24	221945984411744	6935812012867

File NPiX/33PiX=X:

(c) 2014 Jan Bütke

Solutions to $33 \cdot \pi(X) = X$

No	X	pi(X)
1	602656752070527	18262325820319
2	602656752070692	18262325820324
3	602656752070791	18262325820327
4	602656752070824	18262325820328
5	602656752070857	18262325820329
6	602656752070989	18262325820333
7	602656752071055	18262325820335
8	602656752071088	18262325820336
9	602656752071286	18262325820342

File NPiX/34PiX=X:

(c) 2014 Jan Bütke

Solutions to $34 \cdot \pi(X) = X$

No	X	pi(X)
1	1636523496705466	48133044020749
2	1636523496705500	48133044020750
3	1636523496705534	48133044020751

File NPiX/35PiX=X:

(c) 2014 Jan Bütke

Solutions to $35 \cdot \pi(X) = X$

No	X	pi(X)
1	4444280714420575	126979448983445
2	4444280714420610	126979448983446
3	4444280714420680	126979448983448
4	4444280714420715	126979448983449
5	4444280714420750	126979448983450
6	4444280714420785	126979448983451
7	4444280714420855	126979448983453
8	4444280714425860	126979448983596
9	4444280714425895	126979448983597
10	4444280714425930	126979448983598
11	4444280714425965	126979448983599
12	4444280714426000	126979448983600
13	4444280714426350	126979448983610
14	4444280714426455	126979448983613

File NPiX/36PiX=X:

(c) 2014 Jan Bütthe

Solutions to $36*\pi(X)=X$

No	X	pi(X)
1	12069948025326672	335276334036852
2	12069948025329480	335276334036930
3	12069948025329516	335276334036931
4	12069948025329588	335276334036933
5	12069948025329732	335276334036937
6	12069948025329912	335276334036942
7	12069948025330560	335276334036960
8	12069948025330596	335276334036961
9	12069948025335060	335276334037085
10	12069948025335168	335276334037088
11	12069948025335240	335276334037090
12	12069948025335600	335276334037100
13	12069948025335636	335276334037101
14	12069948025335780	335276334037105
15	12069948025335852	335276334037107
16	12069948025336320	335276334037120
17	12069948025336356	335276334037121
18	12069948025336392	335276334037122
19	12069948025337400	335276334037150
20	12069948025337832	335276334037162
21	12069948025338804	335276334037189
22	12069948025338840	335276334037190
23	12069948025338876	335276334037191
24	12069948025338912	335276334037192
25	12069948025339164	335276334037199
26	12069948025339272	335276334037202
27	12069948025339416	335276334037206
28	12069948025339452	335276334037207
29	12069948025339560	335276334037210
30	12069948025339884	335276334037219
31	12069948025339920	335276334037220
32	12069948025342368	335276334037288
33	12069948025342836	335276334037301
34	12069948025342908	335276334037303
35	12069948025342944	335276334037304
36	12069948025342980	335276334037305
37	12069948025343016	335276334037306
38	12069948025343160	335276334037310
39	12069948025343448	335276334037318
40	12069948025343556	335276334037321
41	12069948025343592	335276334037322
42	12069948025343628	335276334037323
43	12069948025343808	335276334037328
44	12069948025347408	335276334037428
45	12069948025347480	335276334037430
46	12069948025347516	335276334037431
47	12069948025347660	335276334037435
48	12069948025347732	335276334037437
49	12069948025347804	335276334037439
50	12069948025348884	335276334037469
51	12069948025348956	335276334037471
52	12069948025349136	335276334037476
53	12069948025349244	335276334037479
54	12069948025349316	335276334037481
55	12069948025350360	335276334037510

File NPiX/37PiX=X:

(c) 2014 Jan Bütthe

Solutions to $37*\pi(X)=X$

No	X	pi(X)
-----	-----	-----

1	32781729631790293	885992692751089
2	32781729631790404	885992692751092
3	32781729631791366	885992692751118
4	32781729631791403	885992692751119
5	32781729631793808	885992692751184
6	32781729631795214	885992692751222
7	32781729631795473	885992692751229
8	32781729631795510	885992692751230
9	32781729631795547	885992692751231
10	32781729631795584	885992692751232
11	32781729631795843	885992692751239
12	32781729631804168	885992692751464
13	32781729631804205	885992692751465
14	32781729631804575	885992692751475
15	32781729631804612	885992692751476
16	32781729631804649	885992692751477
17	32781729631804982	885992692751486
18	32781729631805944	885992692751512
19	32781729631806055	885992692751515
20	32781729631806092	885992692751516
21	32781729631806129	885992692751517
22	32781729631806166	885992692751518
23	32781729631806277	885992692751521
24	32781729631817340	885992692751820
25	32781729631817377	885992692751821
26	32781729631817451	885992692751823
27	32781729631817488	885992692751824
28	32781729631817562	885992692751826
29	32781729631817599	885992692751827
30	32781729631817636	885992692751828
31	32781729631817784	885992692751832
32	32781729631817858	885992692751834
33	32781729631818635	885992692751855
34	32781729631818672	885992692751856
35	32781729631818709	885992692751857
36	32781729631818783	885992692751859

File NPiX/38PiX=X:

(c) 2014 Jan Bütke

Solutions to $38*\pi(X)=X$

No	X	pi(X)
1	89038728550467484	2343124435538618
2	89038728550470866	2343124435538707
3	89038728550470904	2343124435538708

File NPiX/39PiX=X:

(c) 2014 Jan Bütke

Solutions to $39*\pi(X)=X$

No	X	pi(X)
1	241849345578326577	6201265271239143
2	241849345578328098	6201265271239182
3	241849345578328371	6201265271239189
4	241849345578329970	6201265271239230
5	241849345578334182	6201265271239338
6	241849345578335469	6201265271239371
7	241849345578335508	6201265271239372
8	241849345578336171	6201265271239389
14	241849345578338082	6201265271239438
15	241849345578338121	6201265271239439
16	241849345578338238	6201265271239442
17	241849345578338316	6201265271239444

18	241849345578338355	6201265271239445
19	241849345578338394	6201265271239446
20	241849345578338433	6201265271239447
21	241849345578350757	6201265271239763
22	241849345578351030	6201265271239770
23	241849345578351537	6201265271239783
24	241849345578351693	6201265271239787
25	241849345578351732	6201265271239788
26	241849345578359181	6201265271239979
27	241849345578359298	6201265271239982
28	241849345578359415	6201265271239985
29	241849345578359844	6201265271239996
30	241849345578359922	6201265271239998
31	241849345578360117	6201265271240003
32	241849345578360156	6201265271240004
33	241849345578360195	6201265271240005
34	241849345578360273	6201265271240007
35	241849345578362613	6201265271240067
36	241849345578362652	6201265271240068
37	241849345578362769	6201265271240071
38	241849345578363081	6201265271240079
39	241849345578363159	6201265271240081
40	241849345578372870	6201265271240330
41	241849345578372948	6201265271240332
42	241849345578372987	6201265271240333
43	241849345578373104	6201265271240336
44	241849345578373143	6201265271240337
45	241849345578373182	6201265271240338
46	241849345578373221	6201265271240339
47	241849345578374235	6201265271240365
48	241849345578374274	6201265271240366
49	241849345578374586	6201265271240374
50	241849345578374625	6201265271240375
51	241849345578374820	6201265271240380
52	241849345578374859	6201265271240381
53	241849345578374976	6201265271240384
54	241849345578375054	6201265271240386
55	241849345578375561	6201265271240399
56	241849345578375678	6201265271240402
57	241849345578375756	6201265271240404
58	241849345578375795	6201265271240405
59	241849345578375834	6201265271240406
60	241849345578375873	6201265271240407
61	241849345578375912	6201265271240408
62	241849345578375990	6201265271240410
63	241849345578376185	6201265271240415
64	241849345578376224	6201265271240416
65	241849345578376263	6201265271240417

File NPiX/40PiX=X:

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#

Solutions to $40 \cdot \pi(X) = X$

No	X	pi(X)
1	656943924741197840	16423598118529946
2	656943924741197880	16423598118529947
3	656943924741198360	16423598118529959
4	656943924741198400	16423598118529960
5	656943924741214080	16423598118530352
6	656943924741214160	16423598118530354
7	656943924741214240	16423598118530356
8	656943924741246680	16423598118531167
9	656943924741246720	16423598118531168
10	656943924741246920	16423598118531173
11	656943924741246960	16423598118531174
12	656943924741247360	16423598118531184
13	656943924741247400	16423598118531185

14	656943924741247520	16423598118531188
15	656943924741247600	16423598118531190
16	656943924741247640	16423598118531191
17	656943924741247680	16423598118531192
18	656943924741247720	16423598118531193
19	656943924741247840	16423598118531196
20	656943924741247880	16423598118531197
21	656943924741247960	16423598118531199
22	656943924741248680	16423598118531217
23	656943924741248840	16423598118531221
24	656943924741248880	16423598118531222
25	656943924741248920	16423598118531223
26	656943924741250440	16423598118531261
27	656943924741250480	16423598118531262
28	656943924741250960	16423598118531274
29	656943924741251040	16423598118531276
30	656943924741251200	16423598118531280
31	656943924741251240	16423598118531281
32	656943924741251280	16423598118531282
33	656943924741251360	16423598118531284
34	656943924741251600	16423598118531290
35	656943924741251640	16423598118531291
36	656943924741251680	16423598118531292
37	656943924741251760	16423598118531294
38	656943924741252000	16423598118531300
39	656943924741252080	16423598118531302
40	656943924741252320	16423598118531308
41	656943924741252360	16423598118531309
42	656943924741252680	16423598118531317
43	656943924741252720	16423598118531318
44	656943924741253800	16423598118531345
45	656943924741253920	16423598118531348
46	656943924741254120	16423598118531353
47	656943924741254240	16423598118531356
48	656943924741254360	16423598118531359
49	656943924741255480	16423598118531387
50	656943924741255840	16423598118531396
51	656943924741255880	16423598118531397
52	656943924741256000	16423598118531400

File NPiX/41PiX=X:

(c) 2014 Jan Bütke
 #
 # Solutions to $41 \cdot \pi(X) = X$

No	X	pi(X)
1	1784546064357412171	43525513764814931
2	1784546064357412294	43525513764814934
3	1784546064357412458	43525513764814938
4	1784546064357412540	43525513764814940
5	1784546064357412622	43525513764814942
6	1784546064357413278	43525513764814958
7	1784546064357413647	43525513764814967
8	1784546064357413729	43525513764814969
9	1784546064357413811	43525513764814971
10	1784546064357414139	43525513764814979
11	1784546064357416558	43525513764815038
12	1784546064357416599	43525513764815039
13	1784546064357416640	43525513764815040
14	1784546064357419797	43525513764815117
15	1784546064357419838	43525513764815118
16	1784546064357419879	43525513764815119
17	1784546064357419961	43525513764815121
18	1784546064357420166	43525513764815126
19	1784546064357420822	43525513764815142
20	1784546064357472605	43525513764816405
21	1784546064357472646	43525513764816406
22	1784546064357472687	43525513764816407

23	1784546064357472892	43525513764816412
24	1784546064357472933	43525513764816413
25	1784546064357473220	43525513764816420
26	1784546064357473261	43525513764816421
27	1784546064357473302	43525513764816422
28	1784546064357473384	43525513764816424
29	1784546064357474081	43525513764816441
30	1784546064357474122	43525513764816442
31	1784546064357474163	43525513764816443
32	1784546064357474204	43525513764816444
33	1784546064357474245	43525513764816445

File NPiX/42PiX=X:

(c) 2014 Jan Bütke
 #
 # Solutions to $42 \cdot \pi(X) = X$

No	X	pi(X)
1	4847770656544878888	115423110870116164
2	4847770656544878930	115423110870116165
3	4847770656544879518	115423110870116179
4	4847770656544880232	115423110870116196
5	4847770656544880274	115423110870116197
6	4847770656544880316	115423110870116198
7	4847770656544880358	115423110870116199
8	4847770656544880400	115423110870116200
9	4847770656544880442	115423110870116201
10	4847770656544880484	115423110870116202
11	4847770656544882794	115423110870116257
12	4847770656544882836	115423110870116258
13	4847770656544882878	115423110870116259
14	4847770656544882920	115423110870116260
15	4847770656544884558	115423110870116299
16	4847770656544923954	115423110870117237
17	4847770656544923996	115423110870117238
18	4847770656544924080	115423110870117240
19	4847770656544924290	115423110870117245
20	4847770656544924332	115423110870117246
21	4847770656544924374	115423110870117247
22	4847770656544924542	115423110870117251
23	4847770656544924584	115423110870117252
24	4847770656544924626	115423110870117253
25	4847770656544924710	115423110870117255
26	4847770656544924752	115423110870117256
27	4847770656544924962	115423110870117261
28	4847770656544925592	115423110870117276
29	4847770656544925634	115423110870117277
30	4847770656544925802	115423110870117281
31	4847770656544926012	115423110870117286
32	4847770656544926054	115423110870117287
33	4847770656544926726	115423110870117303
34	4847770656544926852	115423110870117306
35	4847770656544927020	115423110870117310
36	4847770656544927188	115423110870117314
37	4847770656544927902	115423110870117331
38	4847770656544927944	115423110870117332
39	4847770656544928574	115423110870117347
40	4847770656544928658	115423110870117349
41	4847770656544929708	115423110870117374
42	4847770656544930086	115423110870117383
43	4847770656544944240	115423110870117720
44	4847770656544944954	115423110870117737
45	4847770656544945038	115423110870117739
46	4847770656544945080	115423110870117740
47	4847770656544945248	115423110870117744
48	4847770656544951380	115423110870117890
49	4847770656544951464	115423110870117892
50	4847770656544951506	115423110870117893

51	4847770656544951884	115423110870117902
52	4847770656544951926	115423110870117903
53	4847770656544952388	115423110870117914
54	4847770656544952766	115423110870117923
55	4847770656544953060	115423110870117930
56	4847770656544954908	115423110870117974
57	4847770656544955244	115423110870117982
58	4847770656544955412	115423110870117986
59	4847770656544955538	115423110870117989
60	4847770656544955580	115423110870117990
61	4847770656544955664	115423110870117992
62	4847770656544955790	115423110870117995
63	4847770656544955832	115423110870117996
64	4847770656544956000	115423110870118000
65	4847770656544956042	115423110870118001
66	4847770656544956084	115423110870118002
67	4847770656544956168	115423110870118004
68	4847770656544956210	115423110870118005
69	4847770656544957932	115423110870118046
70	4847770656544957974	115423110870118047
71	4847770656544958058	115423110870118049
72	4847770656544958352	115423110870118056
73	4847770656544958394	115423110870118057
74	4847770656544958772	115423110870118066
75	4847770656544958814	115423110870118067
76	4847770656544958898	115423110870118069
77	4847770656544959066	115423110870118073
78	4847770656544959108	115423110870118074
79	4847770656544959150	115423110870118075
80	4847770656544959318	115423110870118079
81	4847770656544959360	115423110870118080
82	4847770656544959402	115423110870118081
83	4847770656544959444	115423110870118082
84	4847770656544964652	115423110870118206
85	4847770656544964694	115423110870118207
86	4847770656544964736	115423110870118208
87	4847770656544964778	115423110870118209
88	4847770656544965072	115423110870118216
89	4847770656544965744	115423110870118232
90	4847770656544966374	115423110870118247
91	4847770656544966458	115423110870118249
92	4847770656544966500	115423110870118250
93	4847770656544966542	115423110870118251
94	4847770656544966836	115423110870118258
95	4847770656544967046	115423110870118263
96	4847770656544967088	115423110870118264
97	4847770656544967424	115423110870118272
98	4847770656544967466	115423110870118273
99	4847770656544967550	115423110870118275
100	4847770656544967592	115423110870118276
101	4847770656544967634	115423110870118277
102	4847770656544967676	115423110870118278
103	4847770656544967760	115423110870118280
104	4847770656544967802	115423110870118281
105	4847770656544972632	115423110870118396
106	4847770656544972674	115423110870118397
107	4847770656544973766	115423110870118423
108	4847770656544975950	115423110870118475
109	4847770656544978554	115423110870118537
110	4847770656544978680	115423110870118540
111	4847770656544978722	115423110870118541
112	4847770656544978764	115423110870118542
113	4847770656544978974	115423110870118547
114	4847770656544979184	115423110870118552
115	4847770656544979268	115423110870118554
116	4847770656544979310	115423110870118555
117	4847770656544979352	115423110870118556
118	4847770656544979436	115423110870118558
119	4847770656544979520	115423110870118560
120	4847770656544979688	115423110870118564
121	4847770656544980654	115423110870118587

122	4847770656544996908	115423110870118974
123	4847770656544996992	115423110870118976
124	4847770656544997622	115423110870118991
125	4847770656544997748	115423110870118994
126	4847770656544997790	115423110870118995
127	4847770656544997874	115423110870118997
128	4847770656544997958	115423110870118999
129	4847770656544999008	115423110870119024
130	4847770656544999092	115423110870119026
131	4847770656544999428	115423110870119034
132	4847770656544999680	115423110870119040
133	4847770656544999764	115423110870119042
134	4847770656544999806	115423110870119043
135	4847770656545015472	115423110870119416
136	4847770656545015514	115423110870119417
137	4847770656545015640	115423110870119420
138	4847770656545015682	115423110870119421
139	4847770656545015766	115423110870119423

File NPiX/43PiX=X:

(c) 2014 Jan Bütke

#

Solutions to $43 \cdot \pi(X) = X$

No	X	pi(X)
1	13169525310647352914	306268030480170998
2	13169525310647364911	306268030480171277
3	13169525310647365556	306268030480171292
4	13169525310647365685	306268030480171295
5	13169525310647365814	306268030480171298
6	13169525310647365857	306268030480171299
7	13169525310647366072	306268030480171304
8	13169525310647366115	306268030480171305
9	13169525310647366158	306268030480171306
10	13169525310647366717	306268030480171319
11	13169525310647367061	306268030480171327
12	13169525310647367104	306268030480171328
13	13169525310647367233	306268030480171331
14	13169525310647367276	306268030480171332
15	13169525310647370673	306268030480171411
16	13169525310647370716	306268030480171412
17	13169525310647370802	306268030480171414
18	13169525310647370845	306268030480171415
19	13169525310647370888	306268030480171416
20	13169525310647371060	306268030480171420
21	13169525310647371146	306268030480171422
22	13169525310647371275	306268030480171425
23	13169525310647371361	306268030480171427
24	13169525310647371490	306268030480171430
25	13169525310647371619	306268030480171433
26	13169525310647371662	306268030480171434
27	13169525310647371705	306268030480171435
28	13169525310647371748	306268030480171436
29	13169525310647372092	306268030480171444
30	13169525310647372479	306268030480171453
31	13169525310647372565	306268030480171455
32	13169525310647373683	306268030480171481
33	13169525310647373769	306268030480171483
34	13169525310647374027	306268030480171489
35	13169525310647374672	306268030480171504
36	13169525310647377983	306268030480171581
37	13169525310647378241	306268030480171587
38	13169525310647378370	306268030480171590
39	13169525310647378456	306268030480171592
40	13169525310647378972	306268030480171604
41	13169525310647379058	306268030480171606
42	13169525310647379230	306268030480171610

File NPiX/44PiX=X:

(c) 2014 Jan Bütke

Solutions to $44 \cdot \pi(X) = X$

No	X	pi(X)
1	35777578362249369360	813126780960212940
2	35777578362249369624	813126780960212946

File NPiX/45PiX=X:

(c) 2014 Jan Bütke

Solutions to $45 \cdot \pi(X) = X$

No	X	pi(X)
1	97199410027249992915	2159986889494444287
2	97199410027249992960	2159986889494444288
3	97199410027249993680	2159986889494444304
4	97199410027249993770	2159986889494444306
5	97199410027249993905	2159986889494444309
6	97199410027249994175	2159986889494444315
7	97199410027249994220	2159986889494444316
8	97199410027249994265	2159986889494444317
9	97199410027249994355	2159986889494444319
10	97199410027249994490	2159986889494444322
11	97199410027249994535	2159986889494444323
12	97199410027249994625	2159986889494444325
13	97199410027249994715	2159986889494444327
14	97199410027249995885	2159986889494444353
15	97199410027249995930	2159986889494444354
16	97199410027249995975	2159986889494444355
17	97199410027249996155	2159986889494444359
18	97199410027249996200	2159986889494444360
19	97199410027249996290	2159986889494444362
20	97199410027250041335	2159986889494445363
21	97199410027250041695	2159986889494445371
22	97199410027250042010	2159986889494445378
23	97199410027250042325	2159986889494445385
24	97199410027250044620	2159986889494445436
25	97199410027250044665	2159986889494445437
26	97199410027250044935	2159986889494445443
27	97199410027250044980	2159986889494445444
28	97199410027250046150	2159986889494445470
29	97199410027250046375	2159986889494445475
30	97199410027250046555	2159986889494445479
31	97199410027250046600	2159986889494445480
32	97199410027250046645	2159986889494445481
33	97199410027250046690	2159986889494445482
34	97199410027250047410	2159986889494445498
35	97199410027250047455	2159986889494445499
36	97199410027250047500	2159986889494445500
37	97199410027250047590	2159986889494445502
38	97199410027250048490	2159986889494445522
39	97199410027250048670	2159986889494445526
40	97199410027250048760	2159986889494445528
41	97199410027250049120	2159986889494445536
42	97199410027250049525	2159986889494445545
43	97199410027250049570	2159986889494445546
44	97199410027250050110	2159986889494445558
45	97199410027250050155	2159986889494445559
46	97199410027250050335	2159986889494445563
47	97199410027250050470	2159986889494445566
48	97199410027250050515	2159986889494445567
49	97199410027250050875	2159986889494445575

50	97199410027250050920	2159986889494445576
51	97199410027250051010	2159986889494445578
52	97199410027250051100	2159986889494445580
53	97199410027250052585	2159986889494445613
54	97199410027250052630	2159986889494445614
55	97199410027250059470	2159986889494445766
56	97199410027250059515	2159986889494445767
57	97199410027250060865	2159986889494445797
58	97199410027250061405	2159986889494445809
59	97199410027250061585	2159986889494445813
60	97199410027250061675	2159986889494445815
61	97199410027250061720	2159986889494445816
62	97199410027250061765	2159986889494445817
63	97199410027250061855	2159986889494445819
64	97199410027250064105	2159986889494445869
65	97199410027250064240	2159986889494445872
66	97199410027250064375	2159986889494445875
67	97199410027250064420	2159986889494445876
68	97199410027250064600	2159986889494445880
69	97199410027250064870	2159986889494445886
70	97199410027250066445	2159986889494445921
71	97199410027250104110	2159986889494446758
72	97199410027250104155	2159986889494446759
73	97199410027250104200	2159986889494446760
74	97199410027250104380	2159986889494446764
75	97199410027250104470	2159986889494446766
76	97199410027250104515	2159986889494446767
77	97199410027250104740	2159986889494446772
78	97199410027250105550	2159986889494446790
79	97199410027250106045	2159986889494446801
80	97199410027250106405	2159986889494446809
81	97199410027250123010	2159986889494447178
82	97199410027250123100	2159986889494447180
83	97199410027250123145	2159986889494447181
84	97199410027250123190	2159986889494447182
85	97199410027250123235	2159986889494447183

File NPiX/46PiX=X:

(c) 2014 Jan Bütthe
 #
 # Solutions to $46\pi(X)=X$

No	X	pi(X)
1	264075047224548917472	5740761896185846032
2	264075047224548917886	5740761896185846041
3	264075047224548917932	5740761896185846042
4	264075047224548917978	5740761896185846043
5	264075047224548918024	5740761896185846044
6	264075047224548918162	5740761896185846047
7	264075047224548918208	5740761896185846048
8	264075047224548918254	5740761896185846049
9	264075047224548918300	5740761896185846050
10	264075047224548918576	5740761896185846056
11	264075047224548918714	5740761896185846059
12	264075047224548918990	5740761896185846065
13	264075047224548919312	5740761896185846072
14	264075047224548919358	5740761896185846073
15	264075047224548919956	5740761896185846086
16	264075047224548920600	5740761896185846100
17	264075047224548920876	5740761896185846106
18	264075047224548933480	5740761896185846380
19	264075047224548933526	5740761896185846381
20	264075047224548933986	5740761896185846391
21	264075047224548934032	5740761896185846392
22	264075047224548934124	5740761896185846394
23	264075047224548934170	5740761896185846395
24	264075047224548934262	5740761896185846397
25	264075047224548934354	5740761896185846399

File NPiX/47PiX=X:

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Solutions to $47 \cdot \pi(X) = X$

No	X	pi(X)
1	717466145742128063267	15265237143449533261
2	717466145742128063502	15265237143449533266
3	717466145742128063596	15265237143449533268
4	717466145742128063831	15265237143449533273
5	717466145742128063878	15265237143449533274
6	717466145742128063925	15265237143449533275
7	717466145742128063972	15265237143449533276

File NPiX/48PiX=X:

(c) 2014 Jan Bütke

Solutions to $48 \cdot \pi(X) = X$

No	X	pi(X)
1	1949328764391662651424	40611015924826305238
2	1949328764391662651520	40611015924826305240
3	1949328764391662651568	40611015924826305241
4	1949328764391662651760	40611015924826305245
5	1949328764391662651856	40611015924826305247
6	1949328764391662651904	40611015924826305248
7	1949328764391662663424	40611015924826305488
8	1949328764391662665152	40611015924826305524
9	1949328764391662665200	40611015924826305525
10	1949328764391662665440	40611015924826305530
11	1949328764391662667504	40611015924826305573
12	1949328764391662674320	40611015924826305715
13	1949328764391662676384	40611015924826305758
14	1949328764391662676528	40611015924826305761
15	1949328764391662676576	40611015924826305762
16	1949328764391662679024	40611015924826305813
17	1949328764391662679072	40611015924826305814
18	1949328764391662679120	40611015924826305815
19	1949328764391662679168	40611015924826305816
20	1949328764391662679648	40611015924826305826
21	1949328764391662679696	40611015924826305827
22	1949328764391662686176	40611015924826305962
23	1949328764391662692656	40611015924826306097
24	1949328764391662693568	40611015924826306116
25	1949328764391662693616	40611015924826306117
26	1949328764391662694096	40611015924826306127
27	1949328764391662694288	40611015924826306131
28	1949328764391662694336	40611015924826306132
29	1949328764391662694384	40611015924826306133
30	1949328764391662695440	40611015924826306155
31	1949328764391662695488	40611015924826306156
32	1949328764391662695536	40611015924826306157
33	1949328764391662698272	40611015924826306214
34	1949328764391662698704	40611015924826306223
35	1949328764391662698848	40611015924826306226
36	1949328764391662698896	40611015924826306227
37	1949328764391662698992	40611015924826306229
38	1949328764391662699040	40611015924826306230
39	1949328764391662699136	40611015924826306232
40	1949328764391662699616	40611015924826306242
46	1949328764391662702736	40611015924826306307
47	1949328764391662703120	40611015924826306315
48	1949328764391662703264	40611015924826306318

49	1949328764391662703312	40611015924826306319
50	1949328764391662703456	40611015924826306322
51	1949328764391662705568	40611015924826306366
52	1949328764391662712624	40611015924826306513
53	1949328764391662712672	40611015924826306514
54	1949328764391662712720	40611015924826306515
55	1949328764391662712768	40611015924826306516
56	1949328764391662712816	40611015924826306517
57	1949328764391662713056	40611015924826306522
58	1949328764391662713152	40611015924826306524
59	1949328764391662714496	40611015924826306552
60	1949328764391662715744	40611015924826306578
61	1949328764391662715792	40611015924826306579
62	1949328764391662716704	40611015924826306598
63	1949328764391662719344	40611015924826306653
64	1949328764391662719392	40611015924826306654
65	1949328764391662719680	40611015924826306660
66	1949328764391662719728	40611015924826306661
67	1949328764391662722320	40611015924826306715
68	1949328764391662722368	40611015924826306716
69	1949328764391662722416	40611015924826306717
70	1949328764391662724864	40611015924826306768
71	1949328764391662724960	40611015924826306770
72	1949328764391662725008	40611015924826306771
73	1949328764391662725056	40611015924826306772
74	1949328764391662725104	40611015924826306773
75	1949328764391662725344	40611015924826306778
76	1949328764391662725536	40611015924826306782
77	1949328764391662726016	40611015924826306792
78	1949328764391662726112	40611015924826306794
79	1949328764391662726160	40611015924826306795
80	1949328764391662745696	40611015924826307202
81	1949328764391662745744	40611015924826307203
82	1949328764391662745888	40611015924826307206
83	1949328764391662745936	40611015924826307207
84	1949328764391662746032	40611015924826307209
85	1949328764391662746128	40611015924826307211
86	1949328764391662746272	40611015924826307214
87	1949328764391662746320	40611015924826307215
88	1949328764391662746368	40611015924826307216
89	1949328764391662746416	40611015924826307217
90	1949328764391662746464	40611015924826307218
91	1949328764391662746944	40611015924826307228
92	1949328764391662746992	40611015924826307229
93	1949328764391662747616	40611015924826307242
94	1949328764391662747808	40611015924826307246
95	1949328764391662747904	40611015924826307248
96	1949328764391662747952	40611015924826307249

File NPiX/49PiX=X:

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 #
 # Solutions to $49 \cdot \pi(X) = X$

No	X	pi(X)
1	5296363488157501280423	108089050778724515927
2	5296363488157501280472	108089050778724515928
3	5296363488157501280570	108089050778724515930
4	5296363488157501280619	108089050778724515931
5	5296363488157501281207	108089050778724515943
6	5296363488157501281256	108089050778724515944
7	5296363488157501281305	108089050778724515945
8	5296363488157501281354	108089050778724515946
9	5296363488157501281403	108089050778724515947
10	5296363488157501281452	108089050778724515948
11	5296363488157501281697	108089050778724515953
12	5296363488157501281746	108089050778724515954

13	5296363488157501281795	108089050778724515955
14	5296363488157501281844	108089050778724515956
15	5296363488157501294437	108089050778724516213
16	5296363488157501294486	108089050778724516214

File NPiX/50PiX=X:

(c) 2014 Jan Bütthe
 #
 # Solutions to $50 \cdot \pi(X) = X$

No	X	pi(X)
1	14390600632080526061850	287812012641610521237
2	14390600632080526061900	287812012641610521238
3	14390600632080526062450	287812012641610521249
4	14390600632080526063300	287812012641610521266
5	14390600632080526063650	287812012641610521273
6	14390600632080526063800	287812012641610521276
7	14390600632080526063850	287812012641610521277
8	14390600632080526064350	287812012641610521287
9	14390600632080526066500	287812012641610521330
10	14390600632080526070450	287812012641610521409
11	14390600632080526070550	287812012641610521411
12	14390600632080526070700	287812012641610521414
13	14390600632080526070750	287812012641610521415
14	14390600632080526079700	287812012641610521594
15	14390600632080526079850	287812012641610521597
16	14390600632080526079900	287812012641610521598
17	14390600632080526129050	287812012641610522581
18	14390600632080526129400	287812012641610522588
19	14390600632080526132500	287812012641610522650
20	14390600632080526132550	287812012641610522651
21	14390600632080526132600	287812012641610522652
22	14390600632080526133000	287812012641610522660
23	14390600632080526133300	287812012641610522666
24	14390600632080526134150	287812012641610522683
25	14390600632080526134300	287812012641610522686
26	14390600632080526134600	287812012641610522692
27	14390600632080526134650	287812012641610522693
28	14390600632080526134700	287812012641610522694
29	14390600632080526135050	287812012641610522701
30	14390600632080526139150	287812012641610522783
31	14390600632080526139250	287812012641610522785
32	14390600632080526139400	287812012641610522788
33	14390600632080526157600	287812012641610523152