

# Proof of the Riemann hypothesis

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## Abstract

I could give a complete proof by the number theory method to Riemann hypothesis. I found the following number law. This proved that Riemann hypothesis is correct.

## key words

Riemann hypothesis, Taylor series, Maclaurin expansion

## introduction

The formula is (1).

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s} \quad s = a + bi \quad (1)$$

if  $a=0.5$ , and  $b$  are nontrivial zero values, The above equation is zero.

$$\sum_{n=1}^{\infty} \left[ \frac{\sin(x \ln(2n-1))}{(2n-1)^c} - \frac{\sin(x \ln(2n))}{(2n)^c} \right] \quad (2)$$

if  $c=0.5$ , and  $x$  are nontrivial zero values, the above question are zero.

$$\sum_{n=1}^{\infty} \left[ \frac{\cos(x \ln(2n-1))}{(2n-1)^c} - \frac{\cos(x \ln(2n))}{(2n)^c} \right] \quad (3)$$

if  $c=0.5$ , and  $x$  are nontrivial zero values, (2) and (3) are zero.

Although  $x$  is treated as a real number,  $x$  is a nontrivial zero values.

That is, it takes eternal number of nontrivial zeros of the positive and negative regions on the axis 0.5.

Looking at the formula of Euler's formula(1), I sought out if this could be handled as a cross series.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n^{1-k}} = \sum_{n=1}^{\infty} \left[ \frac{1}{(2n-1)^{1-k}} - \frac{1}{(2n)^{1-k}} \right] \quad (4)$$

$$\text{insert} \quad \cos\theta + i \sin\theta = e^{i\theta} \quad (5)$$

$$\sum_{n=1}^{\infty} \left[ \frac{\cos(x \ln(2n-1)) + i \sin(x \ln(2n-1))}{(2n-1)^{\frac{1}{2}-d}} - \frac{\cos(x \ln(2n)) + i \sin(x \ln(2n))}{(2n)^{\frac{1}{2}-d}} \right] \quad (6)$$

if  $d=0$ , and  $x$  is nontrivial zero values, The above equation is zero.

### Discussion

$$\zeta(s) = \zeta(1-s) \quad (7)$$

From Eq.(7), Eq.(8) is derived from Eq.(6).

$$\sum_{n=1}^{\infty} \left[ \frac{\cos(x \ln(2n-1)) + i \sin(x \ln(2n-1))}{(2n-1)^{\frac{1}{2}+d}} - \frac{\cos(x \ln(2n)) + i \sin(x \ln(2n))}{(2n)^{\frac{1}{2}+d}} \right] \quad (8)$$

if  $d=0$ , and  $x$  is nontrivial zero values, The above equation is zero.

Eq.(2) and Eq.(3) are derived from Eq.(6) and Eq.(8).

From Eq.(6) and Eq.(8).

$$1/2 - d = 1/2 + d = 0.5, \text{ equal } d=0. \quad C= 0.5$$

The proof is completed.

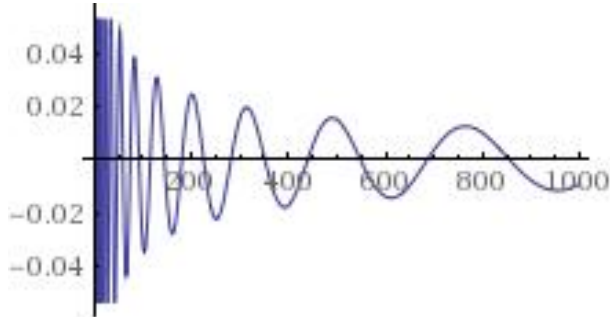
### Examples

### chapter 1

(14.1347- 0.001)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(14.1337) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(14.1337) \ln(2n)]}{(2n)^{0.5}} \right] \quad (9)$$

= -0.009225305555779525779463237679646088942314

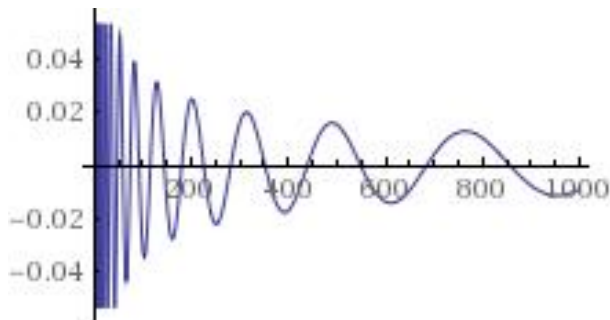


[10000]= 0.0004908595315669325720  
 [100000]= 0.0009616985990964528738  
 [1000000]= 0.0001156893510012422144  
 [10000000]= -0.0001607114065385512091  
 [100000000]=-0.0001509936635404196949  
 not converge

(14.1347 is nontrivial zero value. as it is)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(14.1347) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(14.1347) \ln(2n)]}{(2n)^{0.5}} \right] \quad (10)$$

= -0.009063013671335821519956190406232181070163

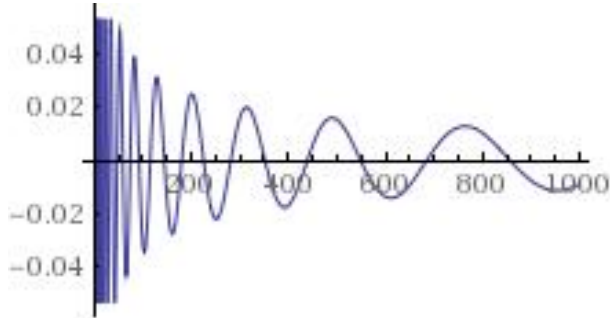


[10000]=0.0006381011115495365026  
 [100000]=0.0010780432416684295090  
 [1000000]=0.0002245632899122298001  
 [10000000]=-0.0000496479275200912434  
 [100000000]=0.0000382288508812898928  
 converge

$$(14.1347 + 0.01 = 14.1447)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(14.1447) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(14.1447) \ln(2n)]}{(2n)^{0.5}} \right] \quad (11)$$

$$= -0.007243403455155722480043192935285864376$$

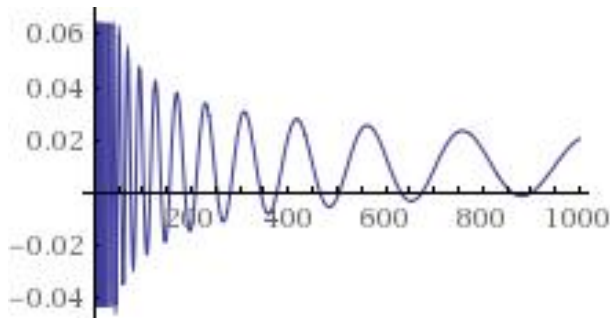


[100000]=0.0024009439859531173274  
 [1000000]=0.0014791973611828108937  
 [10000000]=0.0012301792406834031936  
 [100000000]=0.0012585154544851192247  
 Undecidabl

$$(21.022 - 0.01 = 21.012)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(21.0120) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(21.0120) \ln(2n)]}{(2n)^{0.5}} \right] \quad (12)$$

$$= 0.0202848925540409088275801345992109429$$

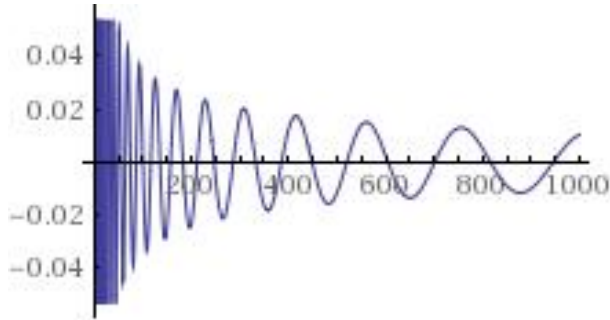


[10000]= 0.0079126943260740684183  
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 [1000000]= 0.0108565621646344659390  
 [10000000]= 0.0104843503975115531074  
 [100000000]=0.0104746550659218524287  
 not converge

(21.0220 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(21.0220) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(21.0220) \ln(2n)]}{(2n)^{0.5}} \right] \quad (13)$$

= 0.01020305097297970756165091906533606755457

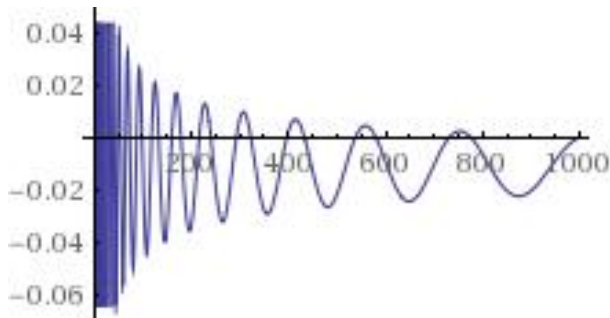


[10000]=-0.0023018856406172511289  
 [100000]=-0.0005496921657573621087  
 [1000000]=0.0003817627764431225329  
 [10000000]=0.0000380957809653702473  
 [100000000]=0.0000070544092957442871  
 converge

(21.0220+0.01=22.0320)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(21.0320) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(21.0320) \ln(2n)]}{(2n)^{0.5}} \right] \quad (14)$$

0.009213501661674673769220937361896999026864

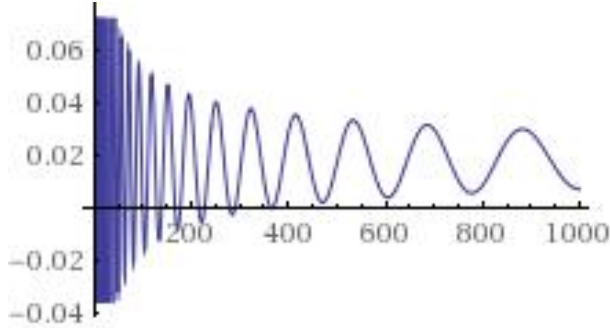


[10000]=-0.0120947862362253185514  
 [100000]=-0.0107270996987019039820  
 [1000000]=-0.0097014813569226230477  
 [10000000]=-0.0100093633835118597103  
 [100000000]=-0.0100605988203420360777  
 not converge

(25.0109-0.01=25.0009)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(25.0009) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(25.0009) \ln(2n)]}{(2n)^{0.5}} \right] \quad (15)$$

= 0.007208956867091058558975679870786427234417.

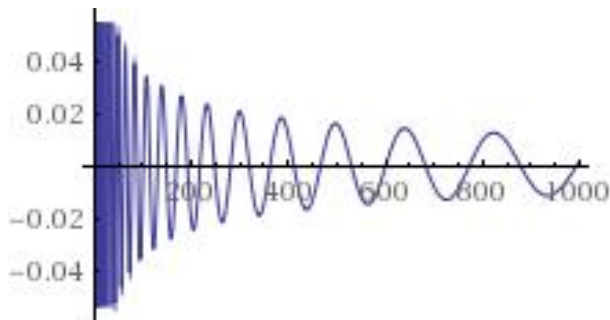


[10000]=-0.0109792843912182164212  
 [100000]=-0.0129018421697284571548  
 [1000000]=-0.0138749666260562180137  
 [10000000]=-0.0140059815308212903817  
 [100000000]=-0.0139521725046484450922  
 not converge

(25.0109 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(25.0109) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(25.0109) \ln(2n)]}{(2n)^{0.5}} \right] \quad (16)$$

= 0.00056641687695438541751539844982701950807..

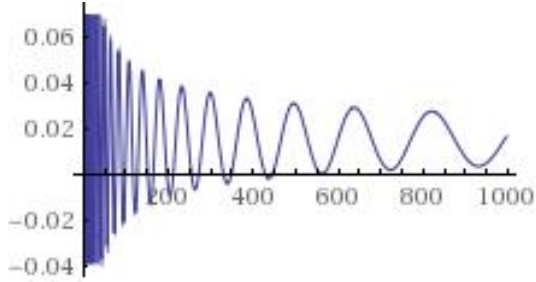


[10000]=0.0031794539716973957769  
 [100000]=0.0010129648076460495264  
 [1000000]=0.0000527725990851316977  
 [10000000]=-0.0000375544556307302004  
 [100000000]=0.0000296005134758246658  
 converge

$$(25.0109+0.01=25.0209)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(25.0209) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(25.0209) \ln(2n)]}{(2n)^{0.5}} \right] \quad (17)$$

$$= 0.0157543246388970080680775464029165522593.$$

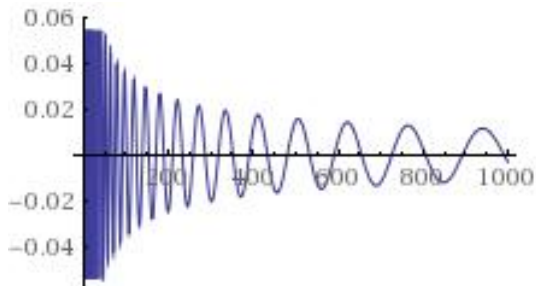


[10000]=0.0176700155045441953394  
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 [1000000]=0.0143430581229324321385  
 [10000000]=0.0142960181287969719660  
 [100000000]=0.0143748762762403066440  
 not converge

$$(30.4249 - 0.01=30.4149)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(30.4149) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(30.4149) \ln(2n)]}{(2n)^{0.5}} \right] \quad (18)$$

$$= -0.00285640901825724095173253445652917101$$

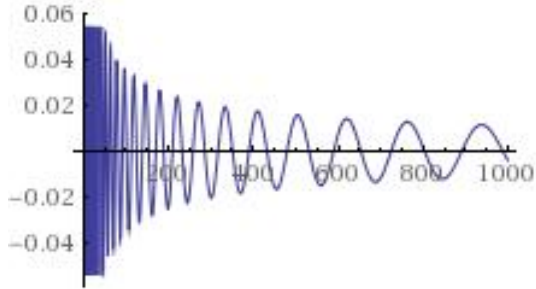


[10000]= -0.0030388948279709746512  
 [100000]= -0.0007134501610826229565  
 [1000000]= 0.0002059339855287456835  
 [10000000]= 0.0003267595999544659156  
 [100000000]=0.0002812429594458024443  
 not converge

(30.4249 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(30.4249) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(30.4249) \ln(2n)]}{(2n)^{0.5}} \right] \quad (19)$$

= -0.00390909023513576029354093055012477.

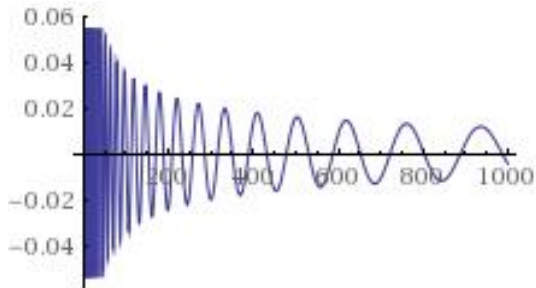


[10000]=-0.0033980444366637999748  
 [100000]=-0.0008825379930712329637  
 [1000000]=0.0000110835698303654228  
 [10000000]=0.000092555270059981509  
 [100000000]=0.0000335427373431973819  
 converge

(30.4249+0.01=30.4349)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(30.4349) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(30.4349) \ln(2n)]}{(2n)^{0.5}} \right] \quad (20)$$

-0.004252440526184255650794899059877558..



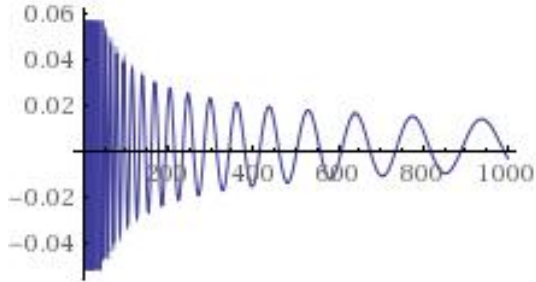
[10000]=-0.0030371364011003336783  
 [100000]=-0.0003517351831407830760  
 [1000000]=0.0005027598472046472316  
 [10000000]=0.0005425030774031609814  
 [100000000]=0.0004713839500665595187  
 not converge



(32.9351-0.01=32.9251)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(32.9251) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(32.9251) \ln(2n)]}{(2n)^{0.5}} \right] \quad (21)$$

= -0.0027020078807583326034090009613837

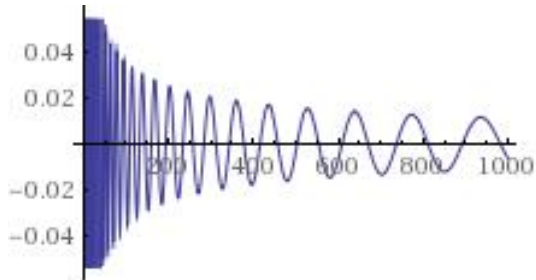


[10000]=-0.0000354846146526247106  
 [100000]=0.0016892426191820577100  
 [1000000]=0.0024278271134448151970  
 [10000000]=0.0026830551451150455762  
 [100000000]=0.0027569421199088403086  
 not converge

(32.9351 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(32.9351) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(32.9351) \ln(2n)]}{(2n)^{0.5}} \right] \quad (22)$$

-0.0062113502323384285481355315202462....

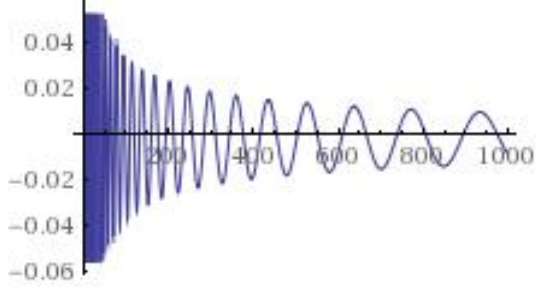


[10000]=-0.0030187974933814079245  
 [100000]=-0.0011198358022496601640  
 [1000000]=-0.0003446395140902848734  
 [10000000]=-0.0000903248133043883523  
 [100000000]=-0.0000221594074273025880  
 converge

$$(32.9351+0.01= 32.9451)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(32.9451) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(32.9451) \ln(2n)]}{(2n)^{0.5}} \right] \quad (23)$$

$$= -0.00893128024726900802406637151594713$$

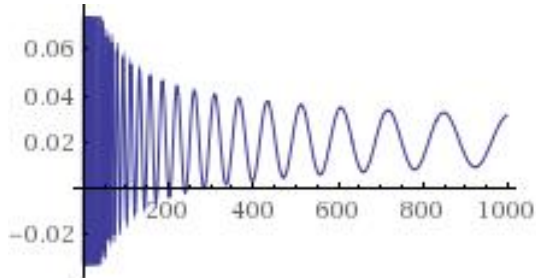


[10000]=-0.0052190215982851530935  
 [100000]= -0.0031587929966095914039  
 [1000000]=-0.0023564632518479375171  
 [10000000]=-0.0021078236331256560571  
 [100000000]=-0.0020471956046321931888  
 not converge

$$(37.5862- 0.01= 37.5762)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(37.5762) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(37.5762) \ln(2n)]}{(2n)^{0.5}} \right] \quad (24)$$

$$0.030834015062143617825619153097923$$

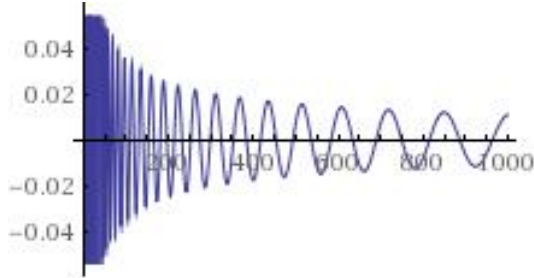


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 [1000000]=0.0199973689427138945351  
 [10000000]=0.0201460868782911001196  
 [100000000]=0.0200503760585013374174  
 not converge

(37.5862 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(37.5862) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(37.5862) \ln(2n)]}{(2n)^{0.5}} \right] \quad (25)$$

0.0109417953902648082779919017459911428..017

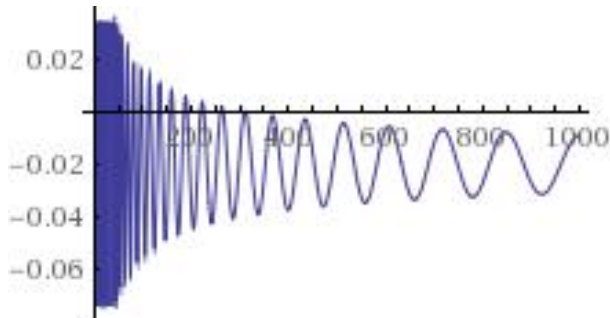


[10000]=-0.0001969237257829878525  
 [100000]=-0.0011553773481789157869  
 [1000000]=-0.0001343416061451328184  
 [10000000]=0.0000587167172489908842  
 [100000000]=-0.0000249459169129748873  
 converge

(37.5862+ 0.01= 37.5962)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(37.5962) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(37.5962) \ln(2n)]}{(2n)^{0.5}} \right] \quad (26)$$

= -0.0089460208968219524737939523273562.

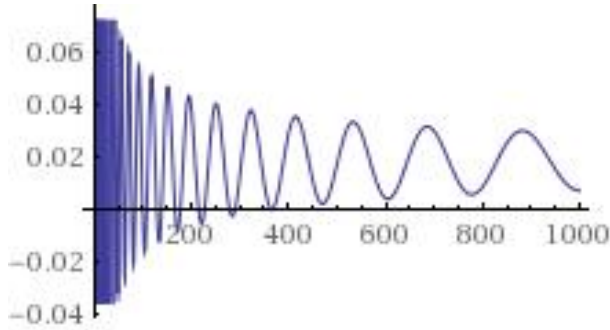


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 [100000]=-0.0211460105720736035728  
 [1000000]=-0.0201963046130781143095  
 [10000000]=-0.0199636989117923310810  
 [100000000]=-0.0200331095329610020528  
 not converge

(40.9187- 0.01= 40.9087)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(40.9087) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(40.9087) \ln(2n)]}{(2n)^{0.5}} \right] \quad (27)$$

=0.00248093561144567463626037082051005.....



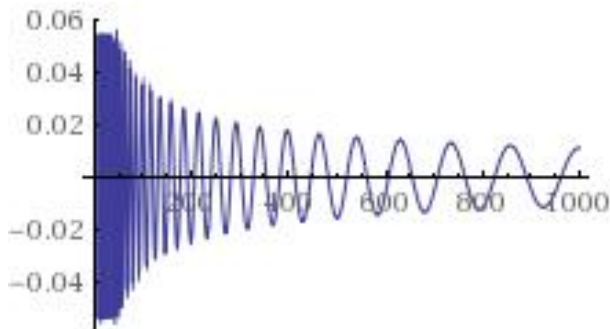
=0.00248093561144567463626037082051005.....

[10000]=-0.0051677833489781012030  
 [100000]=-0.0075751568755802805785  
 [1000000]=-0.0083312236007446627967  
 [10000000]=-0.0085680467375924898588  
 [100000000]=-0.0086420189500060091981  
 not converge

(40.9187 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(40.9187) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(40.9187) \ln(2n)]}{(2n)^{0.5}} \right] \quad (28)$$

= 0.011161443040664347323838871759731.....

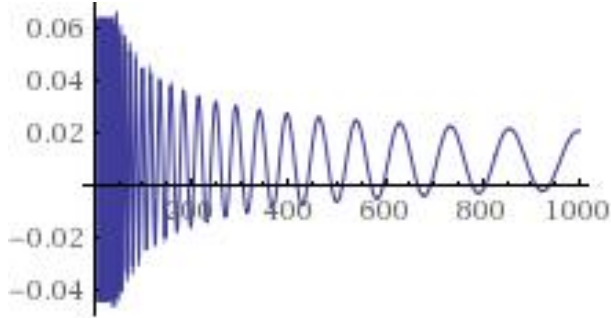


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 [10000000]=0.0000937391247718045875  
 [100000000]=0.0000176604734510305102  
 converge

$$(40.9187 + 0.01 = 40.9287)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(40.9287) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(40.9287) \ln(2n)]}{(2n)^{0.5}} \right] \quad (29)$$

= 0.0206878312138471015409368846686.....

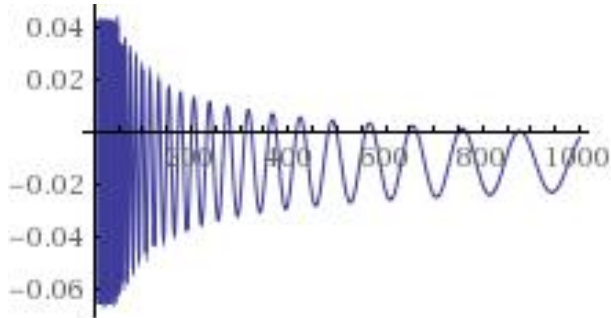


[10000]=0.0130774066708262623471  
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 [1000000]=0.0099041156067228991455  
 [10000000]=0.0096628311670022160734  
 [100000000]=0.0095865032449445348323  
 not converge

$$(43.3271 - 0.01 = 43.3171)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(43.3171) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(43.3171) \ln(2n)]}{(2n)^{0.5}} \right] \quad (30)$$

= -0.0026271844642819244706123872647.....

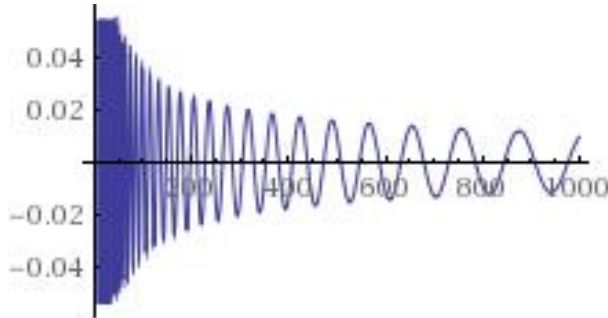


[10000]=-0.0112300972457555110762  
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 [1000000]=-0.0121568283539716555375  
 [10000000]=-0.0118974800268731202568  
 [100000000]=-0.0118126252156 423548756  
 not converge

(43.3271 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(43.3271) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(43.3271) \ln(2n)]}{(2n)^{0.5}} \right] \quad (31)$$

= 0.009670906260156884143514330311804340.....

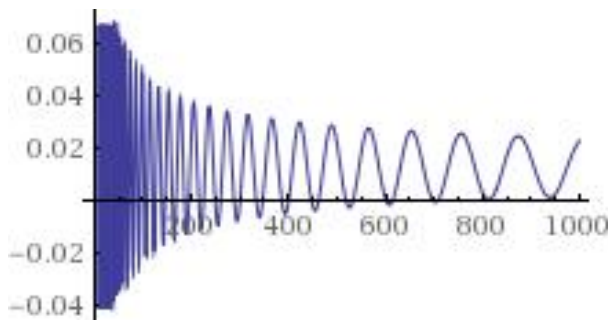


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 [100000]=-0.0005078252057554809556  
 [1000000]=-0.0003051887688908388216  
 [10000000]=-0.0000672058546933808392.....converge

(43.3271+ 0.01= 43.3371)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(43.3371) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(43.3371) \ln(2n)]}{(2n)^{0.5}} \right] \quad (32)$$

= 0.0096709062601568841435143303118

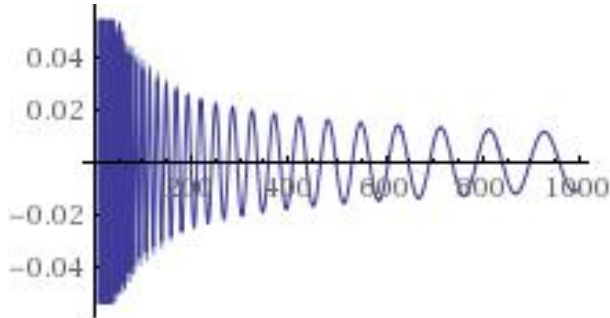


[10000]=0.0138611334436689482424  
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 [1000000]= 0.0122894928302838823964  
 [10000000]=0.0125018265102611169509  
 not converge

(48.0052- 0.01=47.9952)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(47.9952) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(47.9952) \ln(2n)]}{(2n)^{0.5}} \right] \quad (33)$$

= -0.012377763685720218921643303546

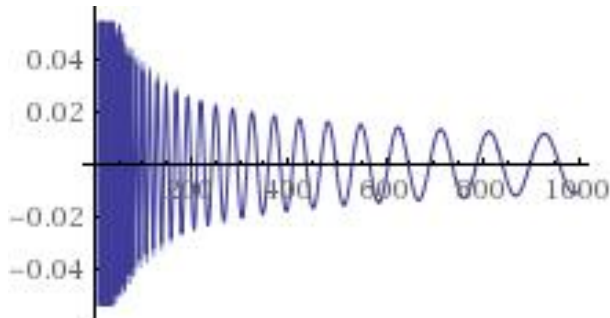


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 [100000]=-0.0021376413863578289966  
 [1000000]=-0.0022192255925806937331  
 [10000000]=-0.0019585239647509334292  
 not converge

(48.0052 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(48.0052) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(48.0052) \ln(2n)]}{(2n)^{0.5}} \right] \quad (34)$$

= -0.009954710963835234494265321374

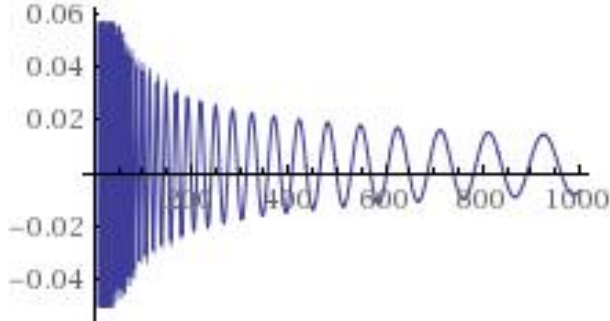


[10000]=0.0018032285340410843938  
 [100000]=0.0000660014107200388242  
 [1000000]=-0.0001954933851270815727  
 [10000000]=0.0001168501874528188322  
 [100000000]=-0.0000222158682941726699  
 converge

$$(48.0052 + 0.01 = 48.0152)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(48.0152) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(48.0152) \ln(2n)]}{(2n)^{0.5}} \right] \quad (35)$$

$$= -0.00659781565293379915294435589$$

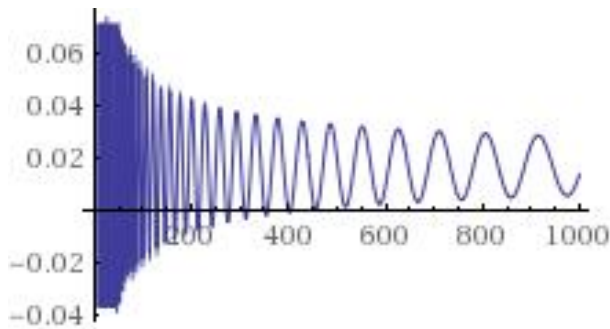


[10000]= 0.0044366094516016078841  
 [100000]=0.0031451285025022525550  
 [1000000]=0.0027088886322526439104  
 [10000000]=0.0030655599344365370811  
 [100000000]=0.0029234203769221956369  
 not converge

$$(49.7738 - 0.01 = 49.7638)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(49.7638) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(49.7638) \ln(2n)]}{(2n)^{0.5}} \right] \quad (36)$$

$$= 0.013838181877048842824089368339.....$$



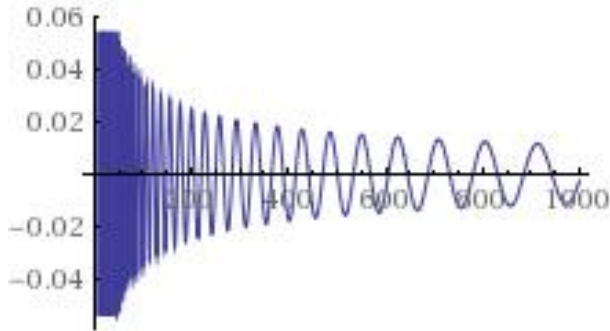
[10000]=0.0204037589236460217834  
 [100000]=0.0176524483959972777747  
 [1000000]=0.0168391658695661756984  
 [10000000]=0.0170716013967882086766  
 [100000000]=0.0171650920761718187024  
 not converge



(49.7738 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(49.7738) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(49.7738) \ln(2n)]}{(2n)^{0.5}} \right] \quad (37)$$

= -0.00242552247843460002977902405986.....

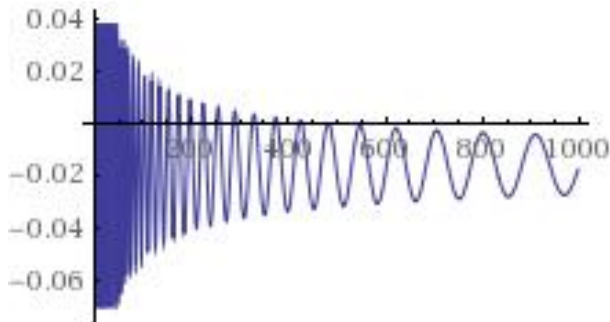


[10000]=0.0034374613798155602418  
 [100000]=0.0004433508278073949134  
 [1000000]=-0.0002692269558208497827  
 [10000000]=0.0000031448364606872906  
 [100000000]=0.0000016971109376292873  
 converge

(49.7738+ 0.01=49.7838)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(49.7838) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(49.7838) \ln(2n)]}{(2n)^{0.5}} \right] \quad (38)$$

= -0.01792553042791727447634460232379546

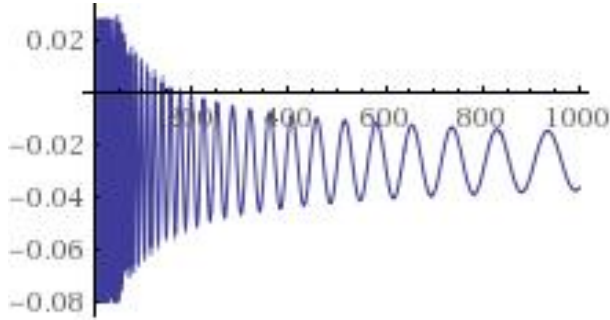


[10000]=-0.0128126155902118996077  
 [100000]=-0.0160221607044494576688  
 [1000000]=-0.0166214463360710926199  
 [10000000]=-0.0163144944504915699601  
 [100000000]=-0.0162474302505595455398  
 not converge

(52.9703- 0.01=52.9603)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(52.9603) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(52.9603) \ln(2n)]}{(2n)^{0.5}} \right] \quad (39)$$

= -0.036355181418336957787246132966042

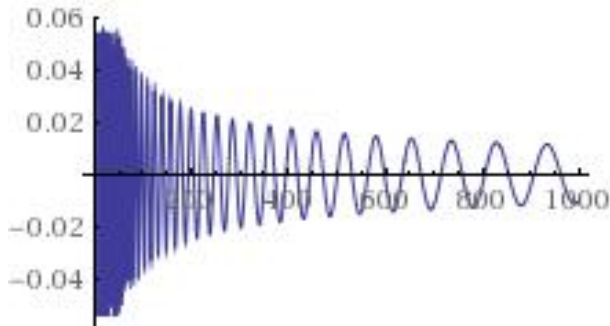


[10000]=-0.0227243930148252754053  
 [100000]=-0.0270512158174514988351  
 [1000000]=-0.0261265188041285185971  
 [10000000]=-0.0261841661259985397647  
 [100000000]=-0.0262460615983426404085  
 not converge

(52.9703 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(52.9703) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(52.9703) \ln(2n)]}{(2n)^{0.5}} \right] \quad (40)$$

=0.0094785200140687480985874

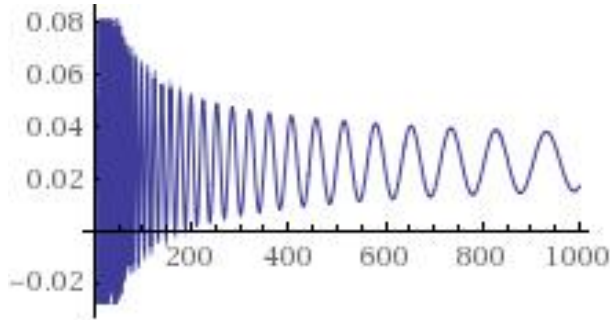


[10000]=0.0034739734404261226469  
 [100000]=-0.0009736503195389328066  
 [1000000]=0.0000840864838235658814  
 [10000000]=-0.0000402288186734236711  
 [100000000]=-0.0000791109926 464973008  
 converge

$$(52.9703+ 0.01=52.9803)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(52.9803) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(52.9803) \ln(2n)]}{(2n)^{0.5}} \right] \quad (41)$$

$$= -0.025638210257456366874529600147.....$$

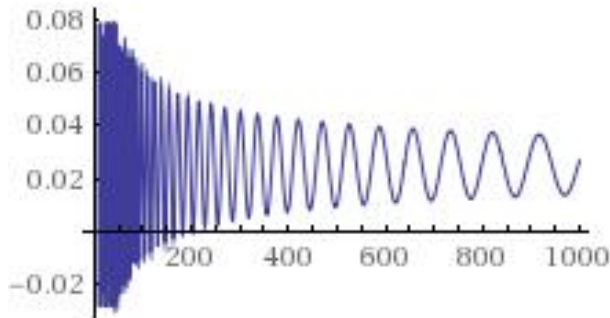


[10000]=0.0298009149632027132981  
 [100000]=0.0252807368145561497941  
 [1000000]=0.0264549124817869858728  
 [10000000]=0.0262664254861674946462  
 [100000000]=0.0262518399485283625283  
 not converge

$$(56.4462- 0.01=56.4362)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(52.9603) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(52.9603) \ln(2n)]}{(2n)^{0.5}} \right] \quad (42)$$

$$= 0.02661362850362773718971974636737.$$

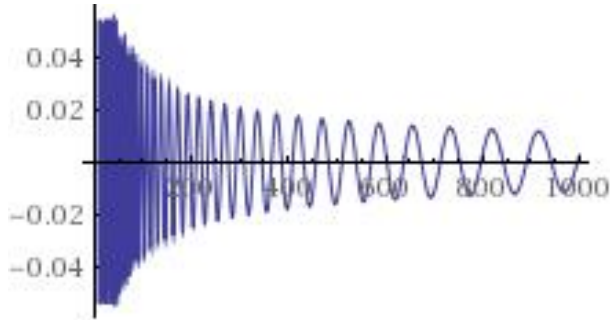


[10000]=0.0215213375849595336953  
 [100000]=0.0256454199486976612554  
 [1000000]=0.0250592910221035559959  
 [10000000]=0.0248005396480182084551  
 [100000000]=0.0249269290298672584194  
 not converge

(56.4462 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(52.9603) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(52.9603) \ln(2n)]}{(2n)^{0.5}} \right] \quad (43)$$

= 0.00265184131020865474001054929688..

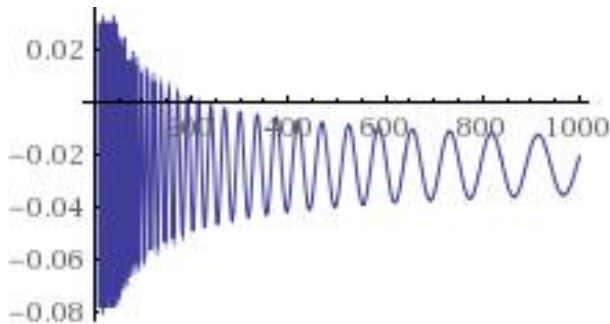


[10000]=-0.0033569416558486631433  
 [100000]=0.0007412009666034661236  
 [1000000]=0.0003082564029241538104  
 [10000000]=0.0000061648527900334994  
 [100000000]=0.0001245625213175247570  
 converge

(56.4462+ 0.01=56.4562)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(56.4562) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(56.4562) \ln(2n)]}{(2n)^{0.5}} \right] \quad (44)$$

= -0.020518507917862853064414308975874..

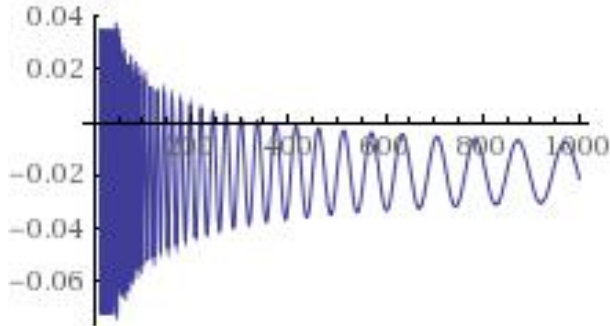


[10000]=-0.0273951025018738907046  
 [100000]=-0.0233662356193842200847  
 [1000000]=-0.0236407303330016561882  
 [10000000]=-0.0239790227111441045516  
 [100000000]=-0.0238720224947596565412  
 not converge

$$(59.3470 - 0.01 = 59.3370)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(59.337) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(59.337) \ln(2n)]}{(2n)^{0.5}} \right] \quad (45)$$

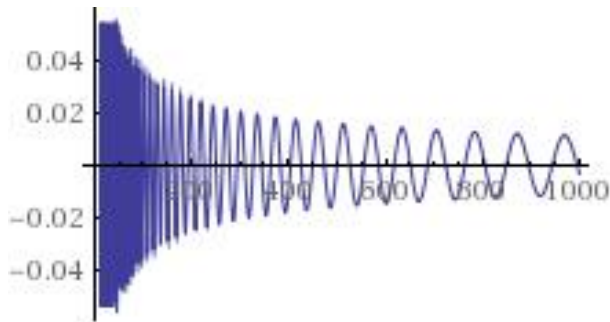
$$= -0.02117544407868147009046644659813.$$



[10000]=-0.0153470935301642623372  
 [100000]=-0.0186832345035133039202  
 [1000000]=-0.0191851092465768376105  
 [10000000]=-0.0188416207259528324658  
 [100000000]=-0.0187981369915568748141  
 not converge

(59.3470 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(59.347) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(59.347) \ln(2n)]}{(2n)^{0.5}} \right] (46) = -0.003249397427817426257297031928$$

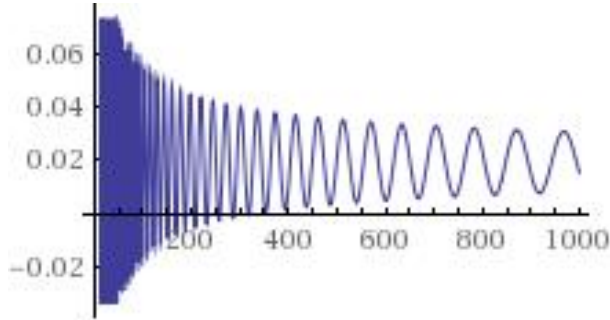


[10000]=0.0033272037996214297653  
 [100000]=0.0001999944676262767817  
 [1000000]=-0.0004266637864907864286  
 [10000000]=-0.0001107110726185287755  
 [100000000]=-0.0000496121879175364362  
 converge

$$(59.3470 + 0.01 = 59.3570)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(59.357) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(59.357) \ln(2n)]}{(2n)^{0.5}} \right] \quad (47)$$

$$= 0.0153674637271575901453641388809426.$$

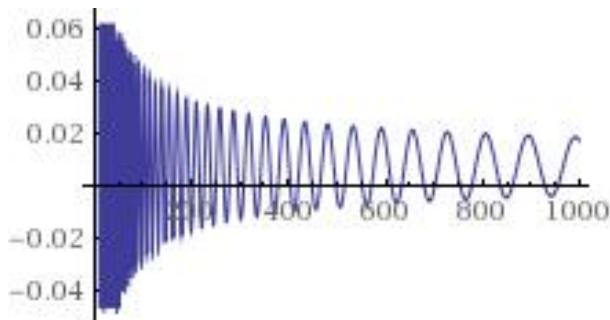


[10000]=0.0226406059802710668549  
 [100000]=0.0197515319113135204288  
 [1000000]=0.0190115164934722205570  
 [10000000]=0.0192934859950445840304  
 [100000000]=0.0193701943315789659739  
 not converge

$$(60.8318 - 0.01 = 60.8218)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(60.8218) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(60.8218) \ln(2n)]}{(2n)^{0.5}} \right] \quad (48)$$

$$= 0.017535560535969578881737935277711.$$

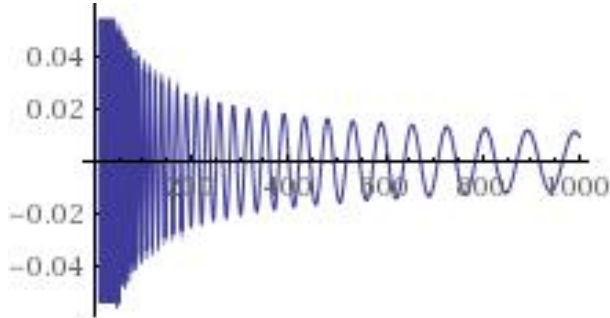


[10000]=0.0053634168996513102365  
 [100000]=0.0071097290555579180371  
 [1000000]=0.0080656137459530069522  
 [10000000]=0.0077438534214533767328  
 [100000000]=0.0076979062723852836186  
 not converge

(60.8318 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(60.8318) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(60.8318) \ln(2n)]}{(2n)^{0.5}} \right] \quad (49)$$

$$= 0.00935045339563112002833035659962320$$

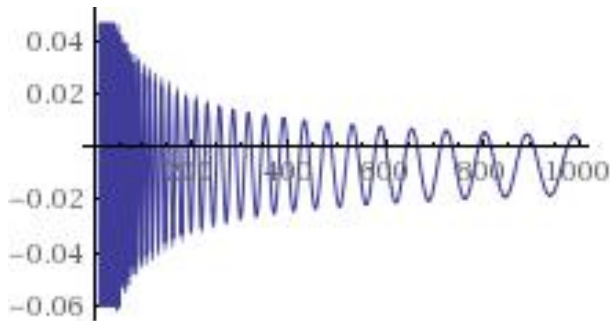


[10000]=-0.0026329489910695037802  
 [100000]=-0.0005211427047658763467  
 [1000000]=0.0003308650681597519964  
 [10000000]=-0.0000234504367579117287  
 [100000000]=-0.0000489979146843307173  
 converge

(60.8318+ 0.01=60.8418)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(60.8418) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(60.8418) \ln(2n)]}{(2n)^{0.5}} \right] \quad (50)$$

$$= 0.0020340324872867370159732423317063180$$

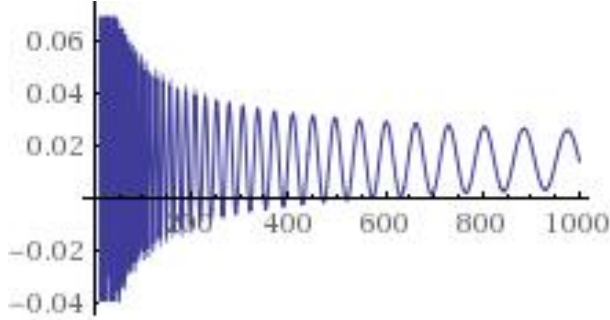


[10000]=-0.0096808902961095563006  
 [100000]=-0.0072217173963795193783  
 [1000000]=-0.0064883898884115342315  
 [10000000]=-0.0068677592993540365410  
 [100000000]=-0.0068719124842466644543  
 not converge

(65.1125- 0.01=65.1025)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(65.1025) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(65.1025) \ln(2n)]}{(2n)^{0.5}} \right] \quad (51)$$

= 0.01455354766716725850019791519965069408..

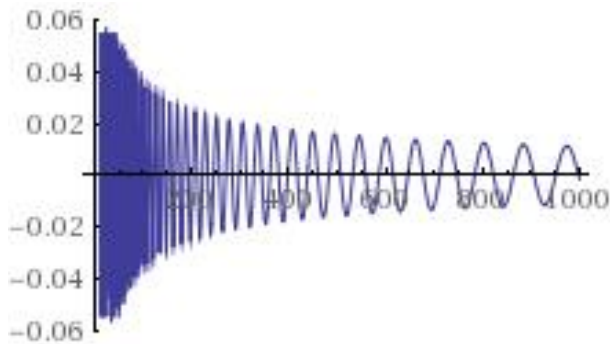


[10000]=0.0178130662139432995039  
 [100000]=0.0162484992948911007027  
 [1000000]=0.0153178316294963045435  
 [10000000]=0.0151053012272931840715  
 [100000000]=0.0151140151910756879994  
 not converge

(65.1125 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(65.1125) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(65.1125) \ln(2n)]}{(2n)^{0.5}} \right] \quad (52)$$

= -0.0013760257837058265259987472825



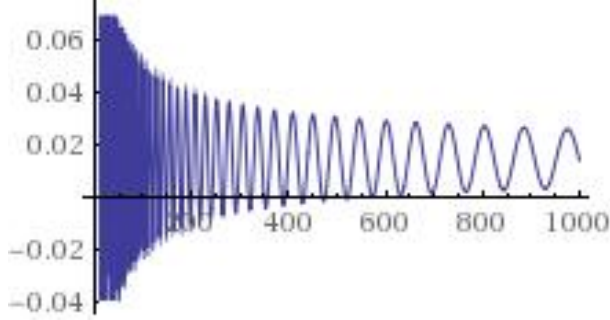
[10000]=0.0024868485483015901651  
 [100000]=0.0011808038497076905112  
 [1000000]=0.0002774053647495089620  
 [10000000]=0.0000397292122541242009  
 [100000000]=0.0000330684738521100997  
 converge



(65.1125+ 0.01=65.1225)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(65.1225) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(65.1225) \ln(2n)]}{(2n)^{0.5}} \right] \quad (53)$$

= -0.01639371889042223977588544036025566

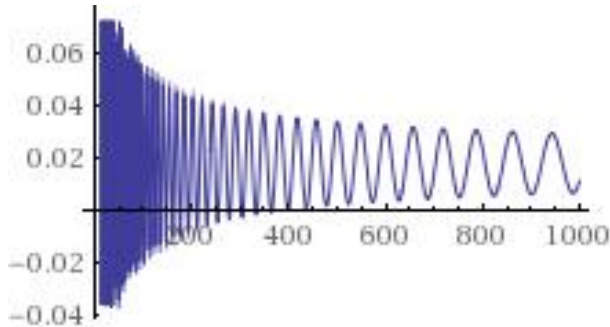


[10000]=-0.0119595467599865334929  
 [100000]=-0.0129999415740921740736  
 [1000000]=-0.0138639340077547287833  
 [10000000]=-0.0141215839941903811144  
 [100000000]=-0.0141431734096021752972  
 not converge

(67.0798- 0.01=67.0698)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(67.0698) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(67.0698) \ln(2n)]}{(2n)^{0.5}} \right] \quad (54)$$

= 0.01054340101298597874827370995356065.

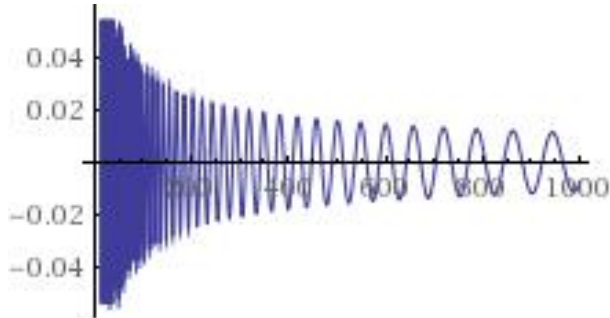


[10000]=0.0185272576419921730650  
 [100000]=0.0180575446703839549711  
 [1000000]=0.0175087936290795401217  
 [10000000]=0.0178615209629044355277  
 [100000000]=0.0177201662173655516419  
 not converge

(67.0798 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(67.0798) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(67.0798) \ln(2n)]}{(2n)^{0.5}} \right] \quad (55)$$

= -0.0065237542293612301177290343425925..

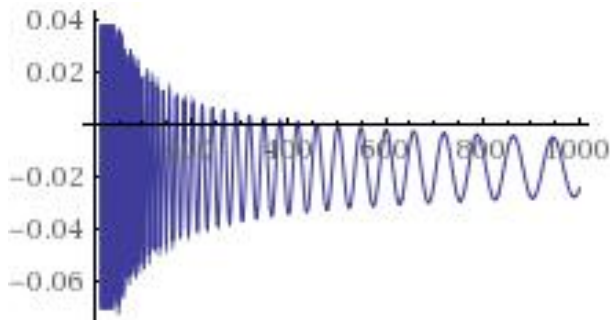


[10000]=0.0004455620242284032877  
 [100000]=0.0004495504034751115607  
 [1000000]=-0.0002621111366443582480  
 [10000000]=0.0001288477260946204589  
 [100000000]=-0.0000147163868139592400  
 converge

(67.0798 + 0.01=67.0898)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(67.0898) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(67.0898) \ln(2n)]}{(2n)^{0.5}} \right] \quad (56)$$

= -0.022435645618969822822622562110867639.

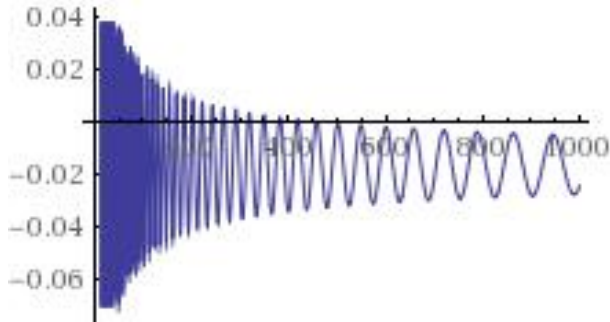


[10000]=-0.0165228379532093849758  
 [100000]=-0.0160473792921948035795  
 [1000000]=-0.0169096431198623928238  
 [10000000]=-0.0164894634928593915302  
 [100000000]=-0.0166309192179651989252  
 not converge

(69.5464 - 0.01= 69.5364)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(69.5364) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(69.5364) \ln(2n)]}{(2n)^{0.5}} \right] \quad (57)$$

= -0.0243297577962054059566184331757303259

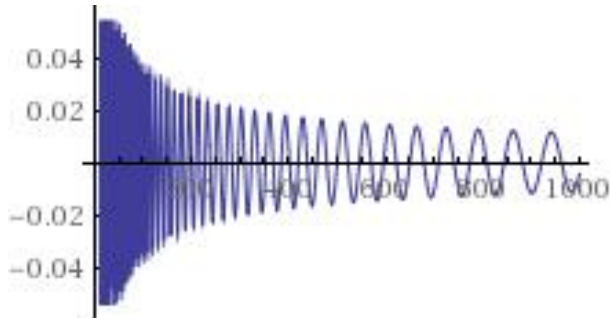


[10000]=-0.01347347924161801992  
 [100000]=-0.0172578985580090112084  
 [1000000]=-0.0159753770631393052226  
 [10000000]=-0.0164030485920629576224  
 [100000000]=-0.0162623947872419447047  
 not converge

(69.5464 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(69.5464) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(69.5464) \ln(2n)]}{(2n)^{0.5}} \right] \quad (58)$$

= -0.00742194981868251334108790488075153

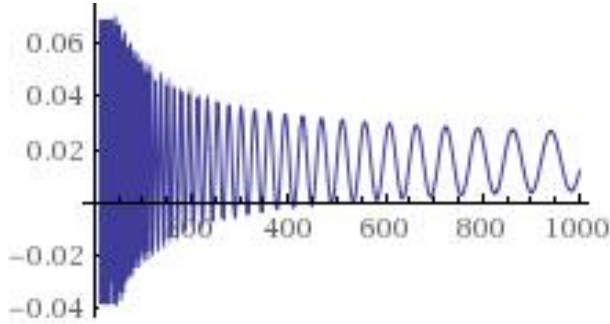


[10000]=0.0025963455525007681293  
 [100000)=-0.0008871211367050240836  
 [1000000]=0.0002940474711544655657  
 [10000000]=-0.0001016062203650079822  
 [100000000]=0.0000296025170157569742  
 converge

(69.5464 + 0.01=69.5564)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(69.5564) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(69.5564) \ln(2n)]}{(2n)^{0.5}} \right] \quad (59)$$

= 0.010867804829161603203853104882137222.

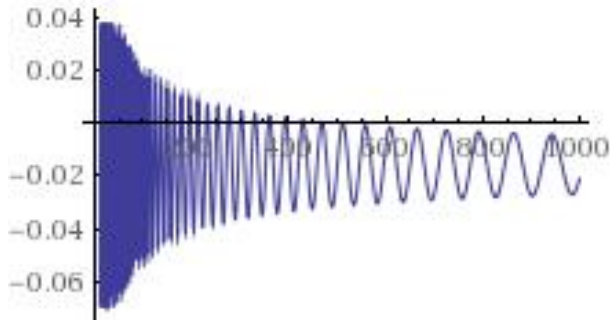


[10000]=0.0199797996968321539546  
 [100000]=0.0168359155842571633910  
 [1000000]=0.0178963339534679265197  
 [10000000]=0.0175417209470739889066  
 [100000000]=0.0176595177076413131778  
 not converge

(72.0672 - 0.01=72.0572)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(72.0572) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(72.0572) \ln(2n)]}{(2n)^{0.5}} \right] \quad (60)$$

= -0.0210743033551647014364941401522796..

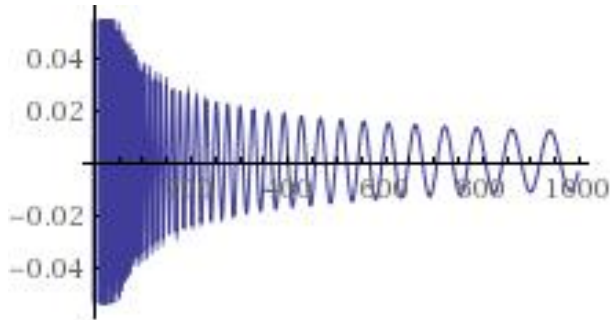


[10000]=-0.0126713775327911490343  
 [100000]=-0.0169220760051842292193  
 [1000000]=-0.0155397673872098192327  
 [10000000]=-0.0158425049243976420743  
 [100000000]=-0.0158212729604979597531  
 not converge

(72.0672 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(72.0672) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(72.0672) \ln(2n)]}{(2n)^{0.5}} \right] \quad (61)$$

= -0.004433077941905571139525695057394011.

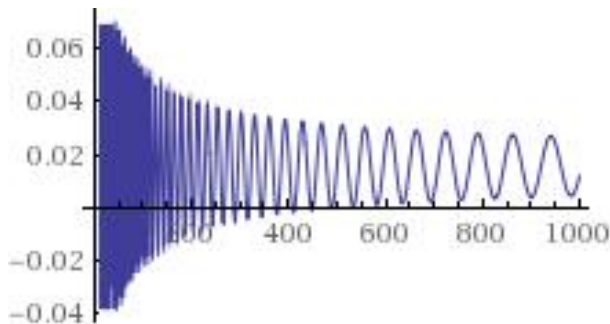


[10000]=0.0030294285324277098019  
 [100000]=-0.0010518535189544097729  
 [1000000]=0.0003671456814411551135  
 [10000000]=0.0000169455603833922448  
 [100000000]=0.0000622802048020602324  
 converge

(72.0672 + 0.01=72.0772)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(72.0672) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(72.0672) \ln(2n)]}{(2n)^{0.5}} \right] \quad (62)$$

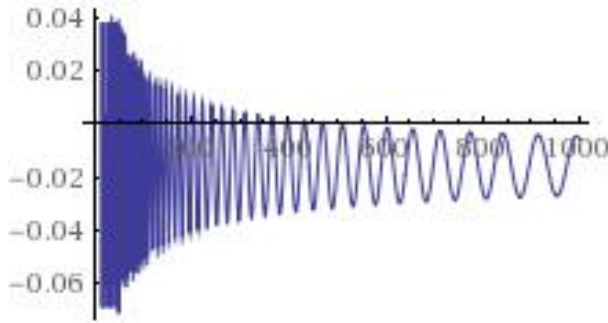
= 0.01170363676792169905229332806333232.



[10000]=0.0181707007646028824432  
 [100000]=0.0143045111219020221194  
 [1000000]=0.0157372394547144987820  
 [10000000]=0.0153472886281138462539  
 [100000000]=0.0154154791762151199136  
 not converge

(75.7047 - 0.01=75.6947)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(75.6947) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(75.6947) \ln(2n)]}{(2n)^{0.5}} \right] \quad (63)$$

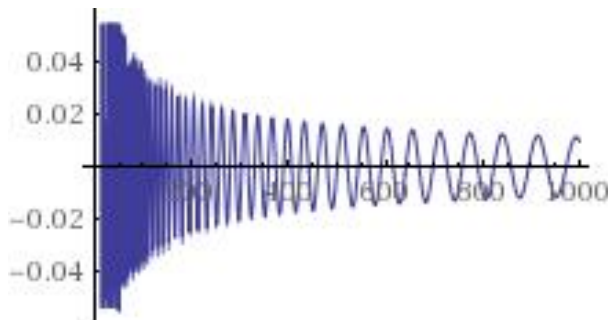


[10000]=-0.0145183117659648756176  
 [100000]=-0.0168743137361940659380  
 [1000000]=-0.0158932270594019514620  
 [10000000]=-0.0156984831255221751745  
 [100000000]=-0.0158045871196352515076  
 not converge

(75.7047 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(75.7047) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(75.7047) \ln(2n)]}{(2n)^{0.5}} \right] \quad (64)$$

= 0.00965362801211004223122426163063638

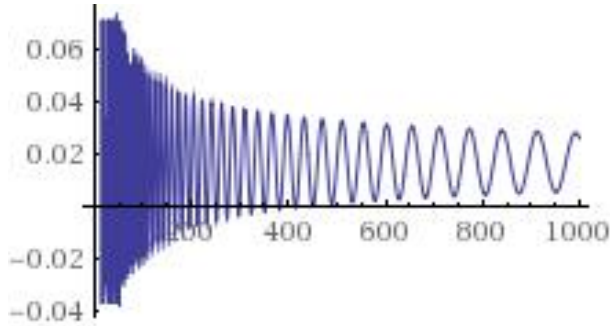


[10000]=0.0016245600108993024473  
 [100000]=-0.0010015153125604158314  
 [1000000]=-0.0001182290513657512342  
 [10000000]=0.0001204084346666212352  
 [100000000]=0.0000257517189773427849  
 converge

(75.7047 + 0.01=75.7147)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(75.7147) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(75.7147) \ln(2n)]}{(2n)^{0.5}} \right] \quad (65)$$

= 0.02603757915450419183152249404869049.

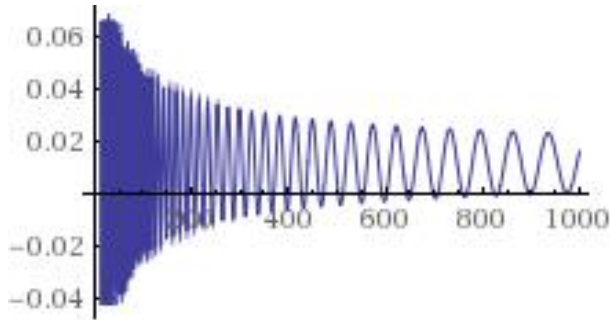


[10000]=0.0187700429043501960946  
 [100000]=0.0159047949088703503839  
 [1000000]=0.0166779554338473551267  
 [10000000]=0.0169547162854766578222  
 [100000000]=0.0168740888732249530446  
 not converge

(77.1448 - 0.01=77.1348)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(77.1348) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(77.1348) \ln(2n)]}{(2n)^{0.5}} \right] \quad (66)$$

= 0.01583745539074428146647286370734127500..

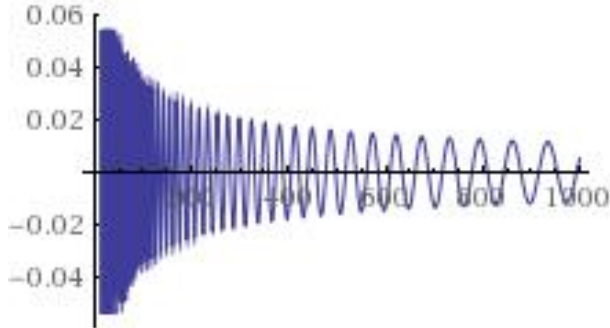


[10000]=0.0145234041256118440177  
 [100000]=0.0107811168707620391727  
 [1000000]=0.0111512206798152439108  
 [10000000]=0.0115001989383124846728  
 [100000000]=0.0114390960849727763710  
 not converge

(77.1448 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(77.1448) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(77.1448) \ln(2n)]}{(2n)^{0.5}} \right] \quad (67)$$

= 0.005230027651272115755657184376504

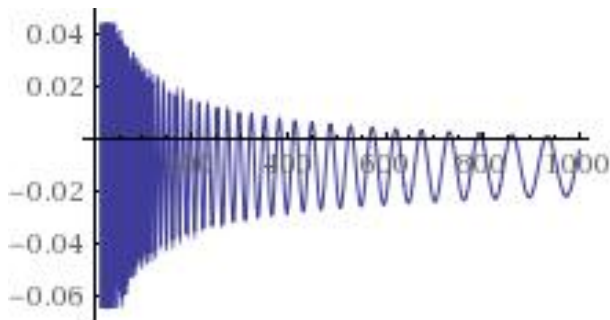


[10000]=0.0029664779953020377519  
 [100000]=-0.0007006166354271297931  
 [1000000]=-0.0001870419726466966779  
 [10000000]=0.0001371403920681105127  
 [100000000]=0.0000587154729794121019  
 converge

(77.1448 + 0.01=77.1548)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(77.1548) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(77.1548) \ln(2n)]}{(2n)^{0.5}} \right] \quad (68)$$

= -0.0043608609812712112493907874542557..



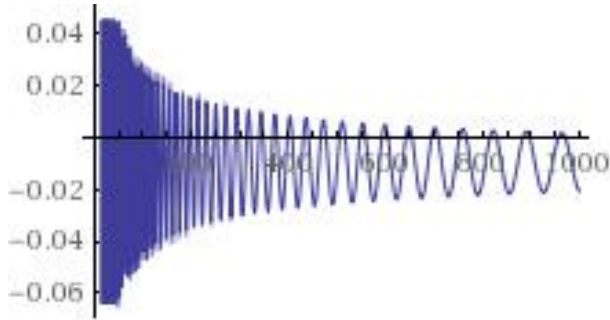
[10000]=-0.0075726021271640304999  
 [100000]=-0.0111247864798120002505  
 [1000000]=-0.0104739693260100571320  
 [10000000]=-0.0101820675996653637468  
 not converge



(79.3374 - 0.01=79.3274)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(79.3274) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(79.3274) \ln(2n)]}{(2n)^{0.5}} \right] \quad (69)$$

= -0.02076513152075744354907712109053746

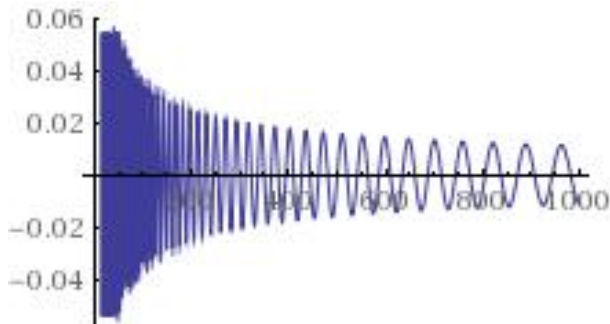


[10000]=0.0081757550311770624957  
 [100000]=0.0107178805140204780333  
 [1000000]=0.0113446414910911078100  
 [10000000]=0.0114396706861565559260  
 [100000000]=0.0114299609176478494943  
 not converge

(79.3374 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(79.3374) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(79.3374) \ln(2n)]}{(2n)^{0.5}} \right] \quad (70)$$

= -0.01106011860300484314739118389904421..

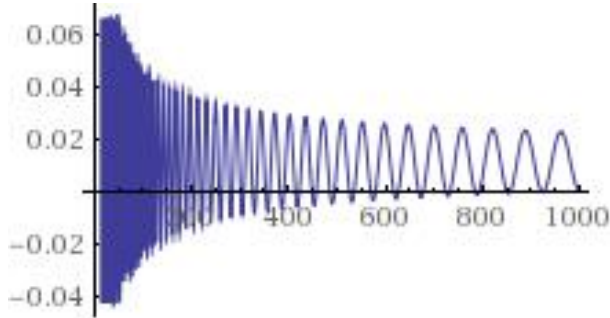


[10000]=-0.0033286483613430535924  
 [100000]=-0.0007622145135349513156  
 [1000000]=-0.0000828611800183551403  
 [10000000]=0.0000436829234382010275  
 [100000000]=0.0000471368163292867377  
 converge

$$(79.3374 + 0.01=79.3474)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(79.3474) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(79.3474) \ln(2n)]}{(2n)^{0.5}} \right] \quad (71)$$

$$= 0.0002394727927926906226549451014682763.$$

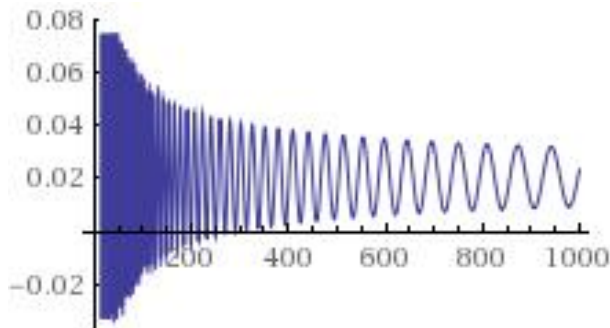


[10000]=0.0081757550311770624957  
 [100000]=0.0107178805140204780333  
 [1000000]=0.0113446414910911078100  
 [10000000]=0.0114396706861565559260  
 [100000000]=0.0114299609176478494943  
 not converge

$$(82.9104 - 0.01=82.9004)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(82.9004) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(82.9004) \ln(2n)]}{(2n)^{0.5}} \right] \quad (72)$$

$$= 0.023282073861962337559387459755070270..$$

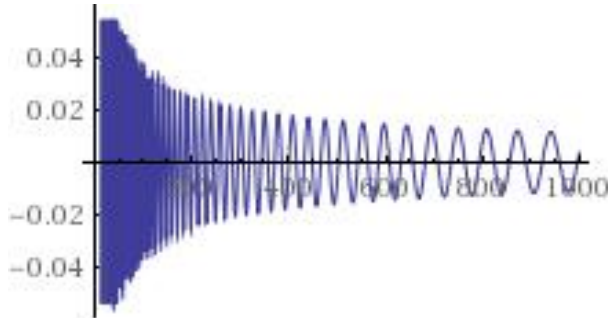


[10000]=0.0222846263592452326074  
 [100000]=0.0194543229123889487020  
 [1000000]=0.0208411982389801672677  
 [10000000]=0.0204842003462149778448  
 [100000000]=0.0205104126644407684654  
 not converge

(82.9104 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(82.9104) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(82.9104) \ln(2n)]}{(2n)^{0.5}} \right] \quad (73)$$

= 0.00353445588698973299308904117790351.

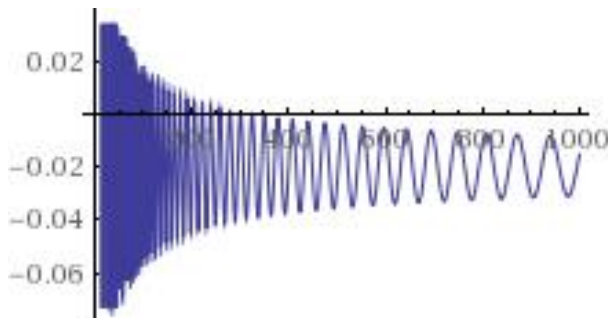


[10000]=0.0014103623601796036642  
 [100000]=-0.0010605598122671972775  
 [1000000]=0.0002978867961682382442  
 [10000000]=-0.0000952393762674968021  
 [100000000]=-0.0000456358162302138902  
 converge

(82.9104 + 0.01=82.9204)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(82.9204) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(82.9204) \ln(2n)]}{(2n)^{0.5}} \right] \quad (74)$$

= -0.0154899634910662258389046813497956.

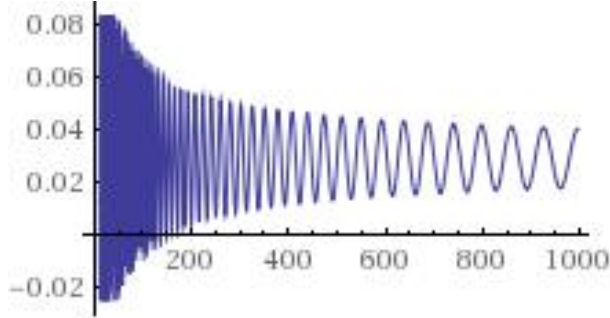


[10000]=-0.0187342688547805988342  
 [100000]=-0.0208164032433105182507  
 [1000000]=-0.0195086635481445599960  
 [10000000]=-0.0199292508559919707978  
 not converge

$$(84.7355 - 0.01=84.7255)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(84.7255) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(84.7255) \ln(2n)]}{(2n)^{0.5}} \right] \quad (75)$$

$$= 0.0396645733911028256955546774667570504.$$

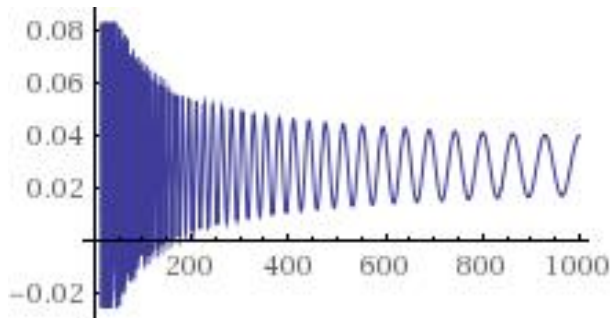


[10000]=0.0318872204225595853866  
 [100000]=0.0294184557494009089884  
 [1000000]=0.0287067629290724581070  
 [10000000]=0.0285249567043578157455  
 [100000000]=0.0284865943793785082738  
 not converge

(84.7355 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(84.7355) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(84.7355) \ln(2n)]}{(2n)^{0.5}} \right] \quad (76)$$

$$= 0.01114105160265642993787875398772657..$$

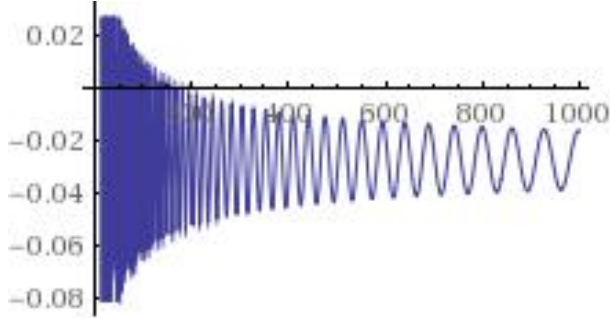


[10000]=0.0032716683727916544625  
 [100000]=0.0008326779381843932206  
 [1000000]=0.0001606701190157385807  
 [10000000]=0.0000029354452761063156  
 [100000000]=-0.0000241664658097951197  
 converge

$$(84.7355 + 0.01=84.7455)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(84.7455) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(84.7455) \ln(2n)]}{(2n)^{0.5}} \right] \quad (77)$$

$$= -0.01634507197229332832488362753685614.$$

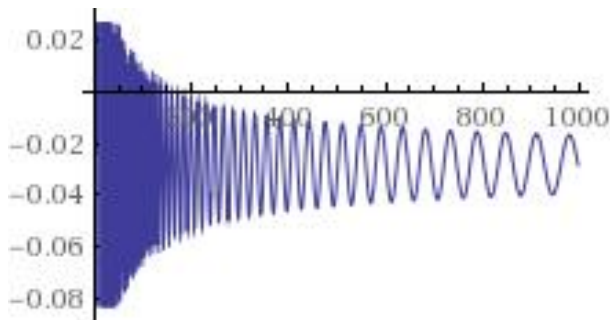


[10000]=-0.0242742873721646205964  
 [100000]=-0.0266639316485210234320  
 [1000000]=-0.0272873605024068974223  
 [10000000]=-0.0274178711569532593262  
 [100000000]=-0.0274329111587670940176  
 not converge

$$(87.4253 - 0.01=87.4153)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(87.4153) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(87.4153) \ln(2n)]}{(2n)^{0.5}} \right] \quad (78)$$

$$= -0.028868238867705496470309995403830767$$

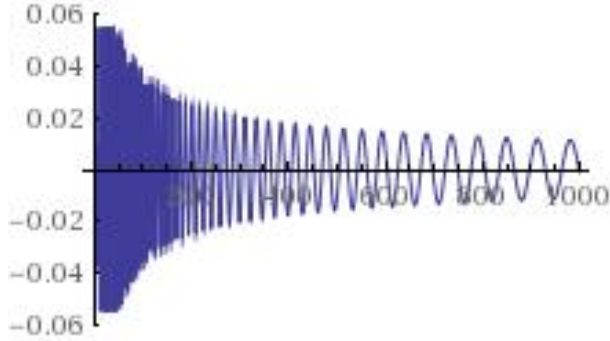


[10000]=-0.0294905492735248811464  
 [100000]=-0.0292174614920240223459  
 [1000000]=-0.0289672758022459127247  
 [10000000]=-0.0288395349215854295000  
 [100000000]=-0.0287856788587947144686  
 not converge

(87.4253 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(87.4253) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(87.4253) \ln(2n)]}{(2n)^{0.5}} \right] \quad (79)$$

= -0.0008885814873853968282314147822626937

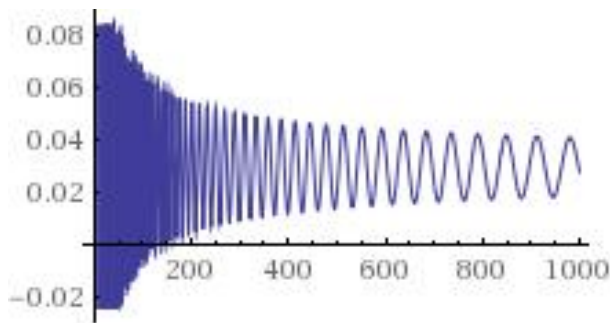


[10000]= -0.0010004497393000491741  
 [100000]= -0.0005095242227744967893  
 [1000000]= -0.0001774559399960536792  
 [10000000]= -0.0000220674631672737237  
 converge

(87.4253 + 0.01=87.4353)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(87.4353) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(87.4353) \ln(2n)]}{(2n)^{0.5}} \right] \quad (80)$$

= 0.02770447484589880891303818419140328.

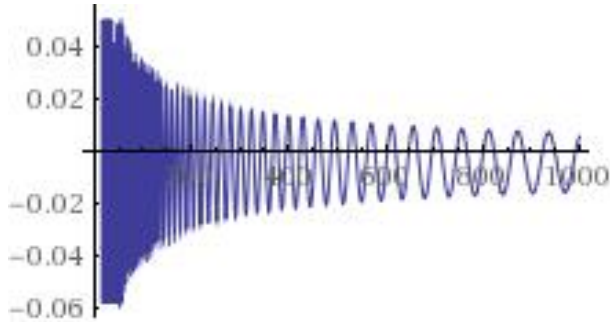


[10000]=0.0281080194080228738807  
 [100000]=0.0288149360292453242394  
 [1000000]=0.0292254876163264634692  
 [10000000]=0.0294059482673889455162  
 [100000000]=0.0294750496713673745819  
 not converge

(88.8091 - 0.01=88.7991)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(88.7991) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(88.7991) \ln(2n)]}{(2n)^{0.5}} \right] \quad (81)$$

= 0.00585253027583306986688681062022843.



[10000]=-0.0075802629627276293250  
 [100000]=-0.0030150819828270061622  
 [1000000]=-0.0044697337538711374300  
 [10000000]=-0.0040379390189374331568  
 [100000000]=-0.0041561060838526033695  
 not converge

(88.8091 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(88.8091) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(88.8091) \ln(2n)]}{(2n)^{0.5}} \right] \quad (82)$$

= 0.0103328970781082668980115307749628.

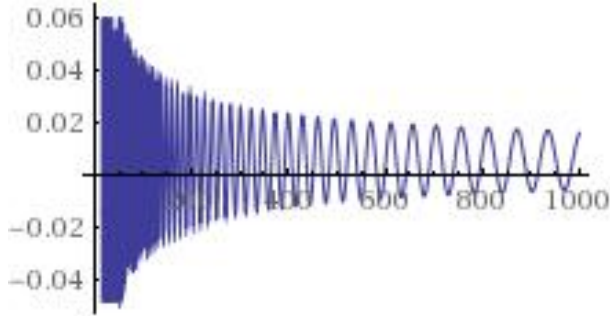


[10000]= -0.0035136809338557582760  
 [100000]= 0.0010982711272328137507  
 [1000000]= -0.0003239705664555260706  
 [10000000]= 0.0000776637060144497345  
 [100000000]= -0.0000237365082598473473  
 converge

(88.8091 + 0.01=88.8191)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(88.8191) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(88.8191) \ln(2n)]}{(2n)^{0.5}} \right] \quad (83)$$

= 0.01593493283752298348725610077429899.

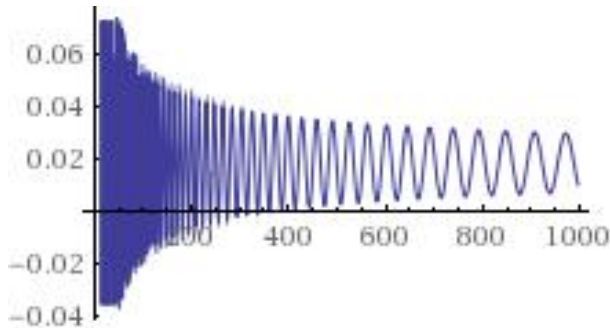


[10000]=0.0017686547806949515400  
 [100000]=0.0063765745429264107311  
 [1000000]=0.0050098608074647396973  
 [10000000]=0.0053722992267073851544  
 [100000000]=0.0052906766583897986422  
 not converge

(92.4919 - 0.01=92.4819)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(92.4819) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(92.4819) \ln(2n)]}{(2n)^{0.5}} \right] \quad (84)$$

= 0.0098019674300467981702972710862591060..



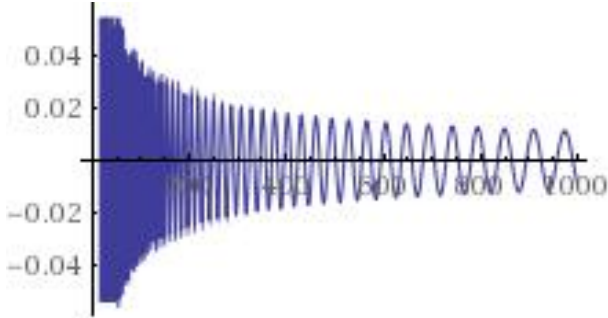
[10000]=0.0175727899371627450942  
 [100000]=0.0185962823074991082106  
 [1000000]=0.0183356254448237623866  
 [10000000]=0.0181058644958792085145  
 [100000000]=0.0180190368161497645183  
 not converge



(92.4919 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(92.4919) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(92.4919) \ln(2n)]}{(2n)^{0.5}} \right] \quad (85)$$

0.008547365010250874501406981302547

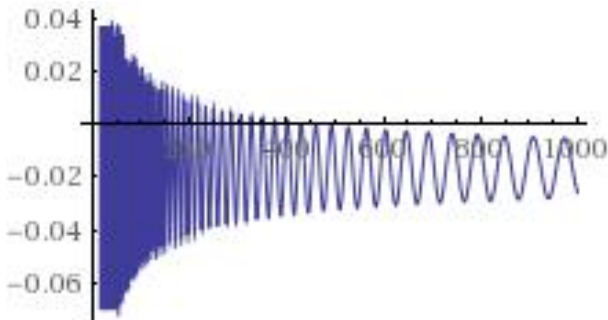


[10000]= -0.0007743076968254169329  
 [100000]= 0.0004744262043307513350  
 [1000000]= 0.0003134308227507082872  
 [10000000]= 0.0001086453122232273349  
 [100000000]= 0.0000222759238317110844  
 converge

(92.4919 + 0.01=92.5019 )

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(92.5019) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(92.5019) \ln(2n)]}{(2n)^{0.5}} \right] \quad (86)$$

= -0.025769922882814007897222100511552408

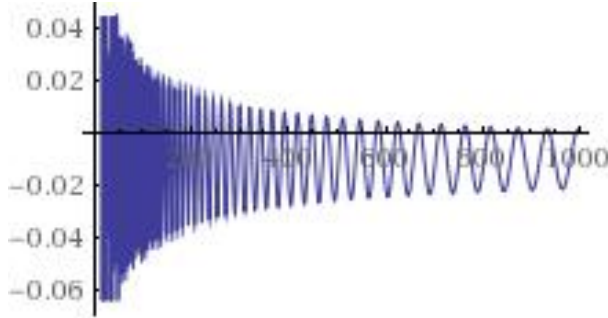


[10000]=-0.0176244246733206419431  
 [100000]=-0.0161651034310129684823  
 [1000000]=-0.0162259716204928086669  
 [10000000]=-0.0164022678319018025417  
 [100000000]=-0.0164859373527452453264  
 not converge

$$(94.6513 - 0.01=94.6413)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(94.6413) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(94.6413) \ln(2n)]}{(2n)^{0.5}} \right] \quad (87)$$

$$= 0.000660819168786540468218909859131396$$

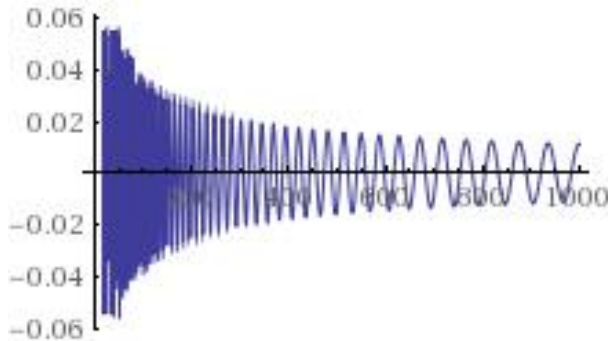


[10000]=-0.0121569785214179423849  
 [100000]=-0.0112000894592297842861  
 [1000000]=-0.0101682718652411838156  
 [10000000]=-0.0105313846942306915677  
 [100000000]=-0.0105406836417775116865  
 not converge

(94.6513 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(94.6513) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(94.6513) \ln(2n)]}{(2n)^{0.5}} \right] \quad (88)$$

$$= 0.011127005476330245290336596568709.$$

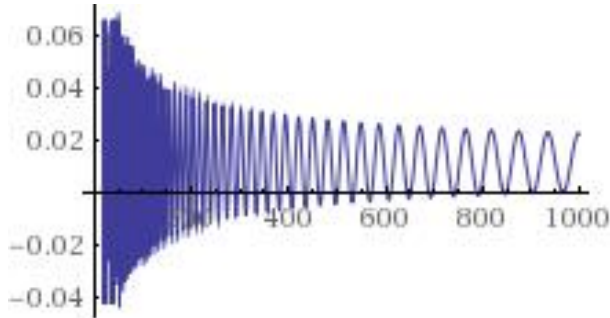


[10000]= -0.0013765254567662944633  
 [100000]= -0.0008392212363509909913  
 [1000000]= 0.0002788508501267524431  
 [10000000]= -0.0000497038044914837129  
 [100000000]=-0.0000309521760194209424  
 converge

$$(94.6513 + 0.01=94.6613)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(94.6613) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(94.6613) \ln(2n)]}{(2n)^{0.5}} \right] \quad (89)$$

$$= 0.0226177350640789660336991357925295..$$

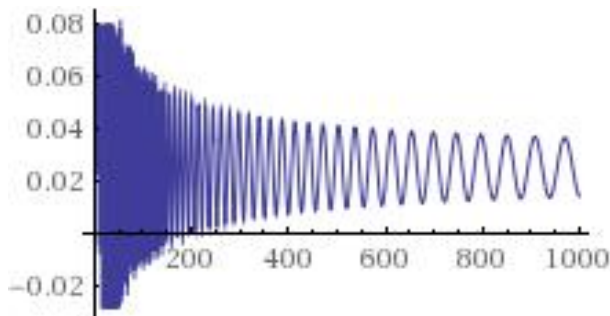


[10000]=0.0105060236444533584843  
 [100000]=0.0106224946041767430438  
 [1000000]=0.0118081762350637931719  
 [10000000]=0.0115210923270080024122  
 [100000000]=0.0114690425146854717980  
 not converge

$$(95.8706 - 0.01=95.8606)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(95.8606) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(95.8606) \ln(2n)]}{(2n)^{0.5}} \right] \quad (90)$$

$$= 0.0141726314708569701042096332852576$$

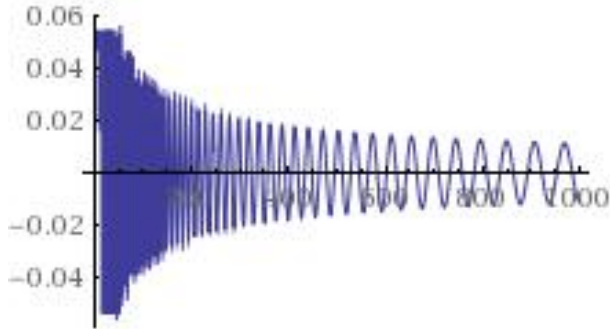


[10000]=0.0222087165335923750198  
 [100000]=0.0249554363954456182029  
 [1000000]=0.0253503637991626534776  
 [10000000]=0.0252465303669947294107  
 [100000000]=0.0251620072925927106000  
 not converge

(95.8706 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(95.8706) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(95.8706) \ln(2n)]}{(2n)^{0.5}} \right] \quad (91)$$

= -0.011014033824321856717273464621484

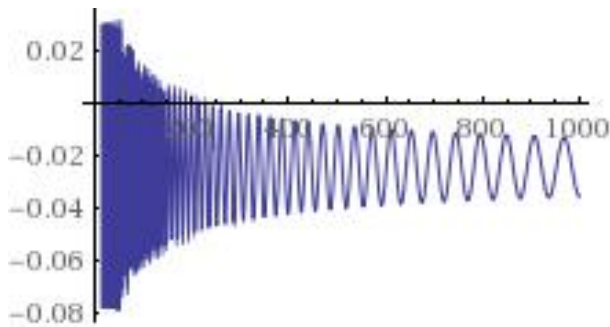


[10000]= -0.0026317155444329789170  
 [100000]= 0.0000402283252831486376  
 [1000000]= 0.0003377731160845019081  
 [10000000]= 0.0001959498109393056735  
 [100000000]= 0.0001062174084937451399  
 converge

(95.8706+ 0.01=95.8806)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(95.8806) \ln(2n-1)]}{(2n-1)^{0.5}} - \frac{\cos[(95.8806) \ln(2n)]}{(2n)^{0.5}} \right] \quad (92)$$

= -0.0353349835789649803594929182725300.

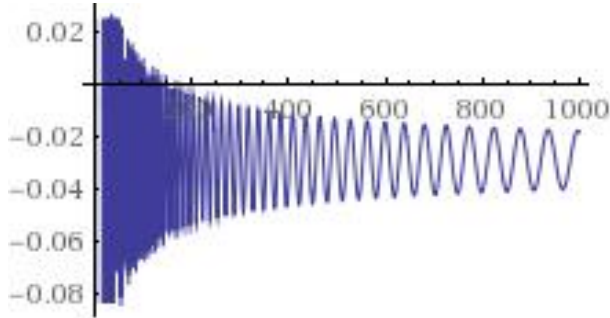


[10000]=-0.0266439074358246347218  
 [100000]=-0.0240727000624901266157  
 [1000000]=-0.0238785193788296559725  
 [10000000]=-0.0240561535769304446486  
 [100000000]=-0.0241487448061668240340  
 not converge

(98.8312 - 0.01=98.8212)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(98.8212) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(98.8212) \ln(2n)]}{(2n)^{0.5}} \right] \quad (93)$$

= -0.01836716410892171545340072825816205.

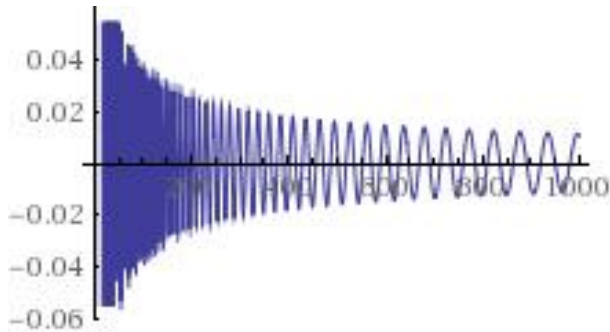


[10000]=-0.0292518955508751753170  
 [100000]=-0.0301065407422408601312  
 [1000000]=-0.0291306835944684996975  
 [10000000]=-0.0289089284578080280008  
 [100000000]=-0.0289757311462570422977  
 not converge

(98.8312 is nontrivial zero value. as it is.)

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(98.8312) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(98.8312) \ln(2n)]}{(2n)^{0.5}} \right] \quad (94)$$

= 0.01035763665582629861002788662670953735774

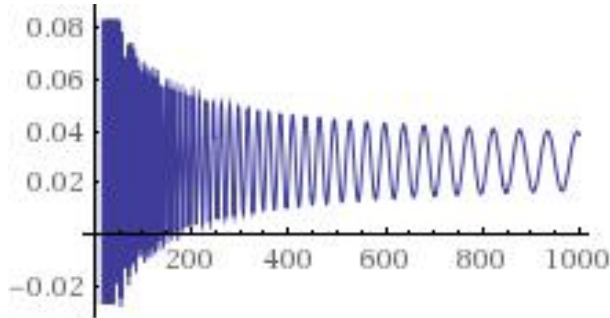


[10000]=-0.0005812758455654100289  
 [100000]=-0.0011009283190770852157  
 [1000000]=-0.0000636630925465695460  
 [10000000]=0.0001183386232722523221  
 [100000000]=0.0000372821209876205499  
 converge

$$(98.8312 + 0.01=98.8412)$$

$$\sum_{n=1}^{1000} \left[ \frac{\cos[(98.8412) \ln(2n - 1)]}{(2n - 1)^{0.5}} - \frac{\cos[(98.8412) \ln(2n)]}{(2n)^{0.5}} \right] \quad (95)$$

$$= 0.038336463236695226503961208870407837$$



[10000]=0.0274089479801120014524  
 [100000]=0.0272350581913820416480  
 [1000000]=0.0283187887816494579529  
 [10000000]=0.0284564818222056009622  
 [100000000]=0.0283632866205242029078  
 not converge

## References

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