```
ClearAll["Global`*"]
```

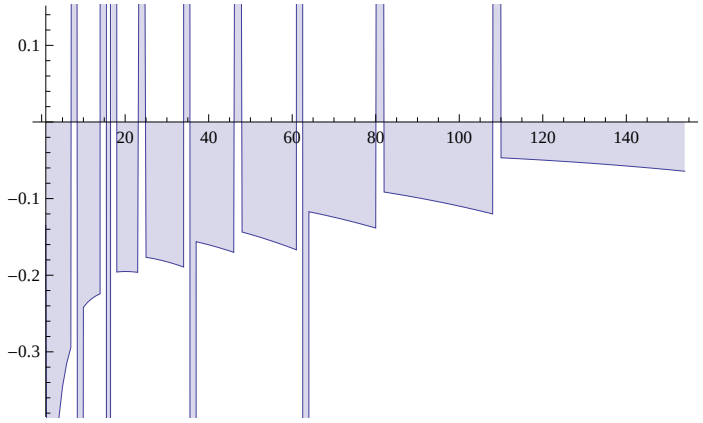
```
E2a[n_, k_, a_] :=
 E2a[n, k, a] = Sum[ E2a[n / j, k - 1, a], {j, 2, n}] - a Sum[ E2a[n / (a j), k - 1, a], {j, 1, n / a}];
E2a[n_, 0, a_] := 1
lin[n_, b_] := Sum[(-1)^(k + 1) / k E2a[n, k, b], {k, 1, Log[2, n]}]
E2ax[n_, k_, a_, c_] := E2ax[n, k, a, c] = Sum[ E2ax[n / j, k - 1, a, c], {j, 2, n}] -
   a^c Sum[ E2ax[n / (a j), k - 1, a, c], {j, 1, n / a}]; E2ax[n_, 0, a_, c_] := 1
linx[n_, b_, c_] := Sum[(-1)^(k + 1) / k E2a[n, k, b], {k, 1, Log[2, n]}]
E2ay[n_, k_, a_, c_] := E2ay[n, k, a, c] = Sum[ E2ay[n / j, k - 1, a, c], {j, 2, n}] +
   a^c Sum[ E2ay[n / (a j), k - 1, a, c], {j, 1, n / a}]; E2ay[n_, 0, a_, c_] := 1
liny[n_, b_, c_] := Sum[(-1)^(k + 1) / k E2a[n, k, b], {k, 1, Log[2, n]}]
$RecursionLimit = 10 000
```

```
10 000
```

```
lin[100, 2]
```

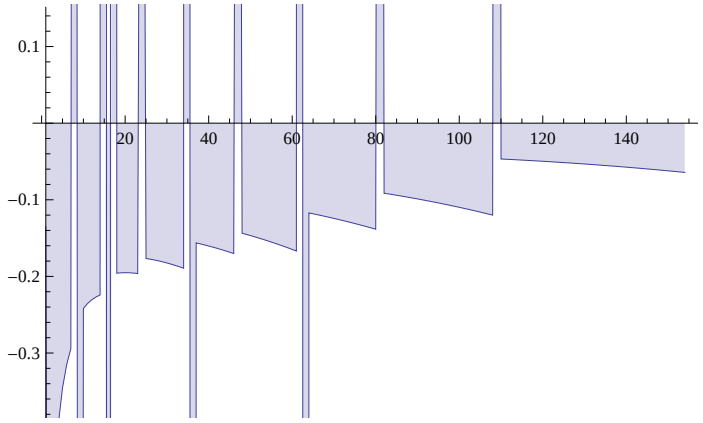
$$\frac{4}{5}$$

```
DiscretePlot[(-1)^(k + 1) / k E2a[10, k, 1.015], {k, 1, Log[1.015, 10]}]
```

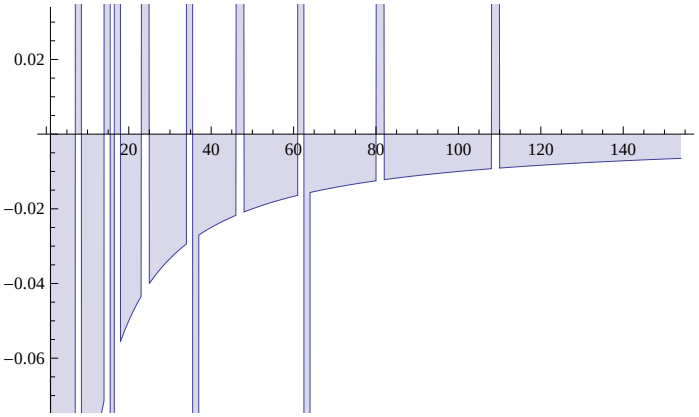



```
10 000
```

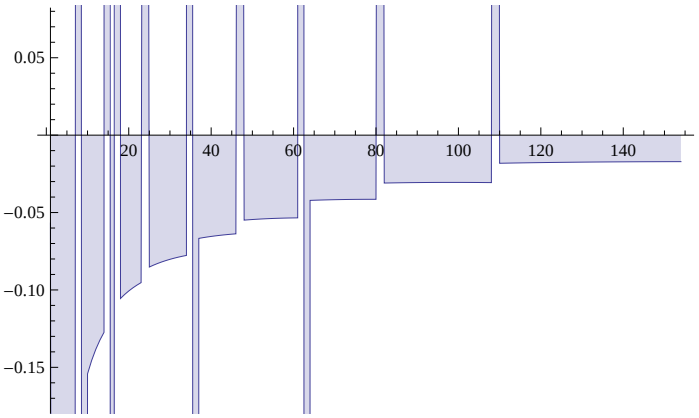
```
DiscretePlot[(-1)^(k + 1) / k E2ax[10, k, 1.015, 1], {k, 1, Log[1.015, 10]}]
```



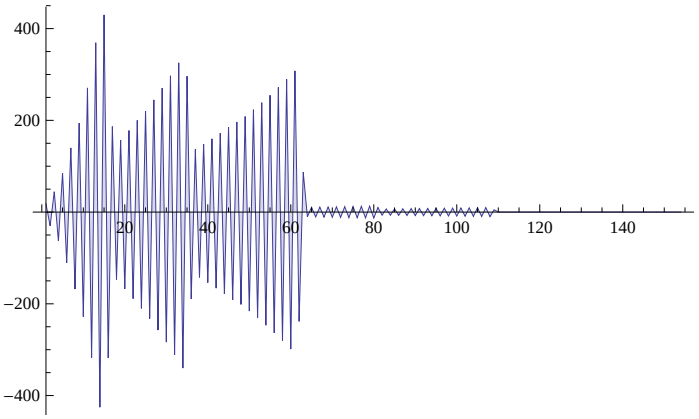
```
DiscretePlot[(-1)^(k + 1) / k E2ax[10, k, 1.015, 0], {k, 1, Log[1.015, 10]}]
```




```
DiscretePlot[(-1)^(k + 1) / k E2ax[10, k, 1.015, 1 - EulerGamma], {k, 1, Log[1.015, 10]}]
```




```
DiscretePlot[(-1)^(k + 1) / k E2ay[10, k, 1.015, 1], {k, 1, Log[1.015, 10]}]
```




```
pp[k_, a_] := (-1)^(k + 1) / k E2ax[10, k, 1.015, a]
pp2[k_, a_] := (-1)^(k + 1) / k E2ay[10, k, 1.015, a]
```

```
Table[{1.015^k, pp[k, 1], pp[k, 0], pp[k, 1 / 2]}, {k, 1, Log[1.015, 10]}] // TableForm
```

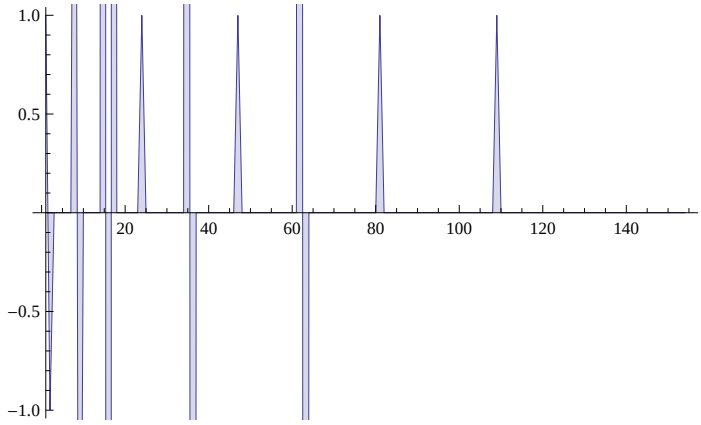
```
1.015      -0.135       0.           -0.0672488
1.03022    -1.63759     -1.5         -1.56789
1.04568    -0.473558    -0.333333    -0.401872
```

1.06136	−0.392912	−0.25	−0.319193
1.07728	−0.345651	−0.2	−0.269854
1.09344	−0.315108	−0.166667	−0.237188
1.10984	−0.294143	−0.142857	−0.214051
1.12649	4.79003	4.375	4.57926
1.14339	−4.68973	−4.11111	−4.38947
1.16054	−0.241858	−0.1	−0.164996
1.17795	−0.235432	−0.0909091	−0.156513
1.19562	−0.230571	−0.0833333	−0.14955
1.21355	−0.226927	−0.0769231	−0.143759
1.23176	−0.224252	−0.0714286	−0.13889
1.25023	56.4548	45.2667	50.5542
1.26899	−105.534	−85.0625	−94.7468
1.28802	49.0735	39.9412	44.275
1.30734	−0.195833	−0.0555556	−0.116006
1.32695	−0.195325	−0.0526316	−0.1136
1.34686	−0.195152	−0.05	−0.11149
1.36706	−0.195272	−0.047619	−0.109636
1.38756	−0.195652	−0.0454545	−0.108003
1.40838	−0.196265	−0.0434783	−0.106562
1.4295	1.23242	0.958333	1.09033
1.45095	−0.176658	−0.04	−0.0952362
1.47271	−0.177525	−0.0384615	−0.0941809
1.4948	−0.178548	−0.037037	−0.0932439
1.51722	−0.179717	−0.0357143	−0.092413
1.53998	−0.18102	−0.0344828	−0.0916776
1.56308	−0.182451	−0.0333333	−0.0910287
1.58653	−0.184002	−0.0322581	−0.0904584
1.61032	−0.185666	−0.03125	−0.0899598
1.63448	−0.187438	−0.030303	−0.0895269
1.659	−0.189315	−0.0294118	−0.0891541
1.68388	58.7446	34.9714	45.3287
1.70914	−58.2199	−35.0278	−45.1571
1.73478	−0.156254	−0.027027	−0.0759759
1.7608	−0.157538	−0.0263158	−0.0756363
1.78721	−0.15889	−0.025641	−0.0753362
1.81402	−0.160309	−0.025	−0.0750728
1.84123	−0.161792	−0.0243902	−0.0748436
1.86885	−0.163337	−0.0238095	−0.0746466
1.89688	−0.164944	−0.0232558	−0.0744796
1.92533	−0.166611	−0.0227273	−0.0743409
1.95421	−0.168336	−0.0222222	−0.0742288
1.98353	−0.17012	−0.0217391	−0.0741418
2.01328	1.84132	0.978723	1.34482
2.04348	−0.143658	−0.0208333	−0.0634356
2.07413	−0.145157	−0.0204082	−0.0633369
2.10524	−0.146705	−0.02	−0.0632578
2.13682	−0.148301	−0.0196078	−0.0631975
2.16887	−0.149945	−0.0192308	−0.0631549
2.20141	−0.151636	−0.0188679	−0.0631292
2.23443	−0.153373	−0.0185185	−0.0631197
2.26794	−0.155158	−0.0181818	−0.0631257
2.30196	−0.156989	−0.0178571	−0.0631465
2.33649	−0.158867	−0.0175439	−0.0631815
2.37154	−0.160792	−0.0172414	−0.0632302
2.40711	−0.162763	−0.0169492	−0.0632919

2.44322	−0.164782	−0.0166667	−0.0633663
2.47987	−0.166846	−0.0163934	−0.0634528
2.51707	79.1186	31.4839	49.912
2.55482	−76.992	−31.0159	−48.8666
2.59314	−0.117163	−0.015625	−0.0490478
2.63204	−0.118287	−0.0153846	−0.0490243
2.67152	−0.119439	−0.0151515	−0.0490096
2.7116	−0.120617	−0.0149254	−0.0490034
2.75227	−0.121822	−0.0147059	−0.0490054
2.79355	−0.123054	−0.0144928	−0.0490154
2.83546	−0.124313	−0.0142857	−0.049033
2.87799	−0.125599	−0.0140845	−0.0490581
2.92116	−0.126911	−0.0138889	−0.0490903
2.96498	−0.128251	−0.0136986	−0.0491295
3.00945	−0.129618	−0.0135135	−0.0491754
3.05459	−0.131011	−0.0133333	−0.049228
3.10041	−0.132433	−0.0131579	−0.0492869
3.14692	−0.133881	−0.012987	−0.049352
3.19412	−0.135358	−0.0128205	−0.0494232
3.24203	−0.136862	−0.0126582	−0.0495003
3.29066	−0.138394	−0.0125	−0.0495832
3.34002	3.20007	0.987654	1.7779
3.39012	−0.0914433	−0.0121951	−0.0361098
3.44097	−0.0923094	−0.0120482	−0.0361071
3.49259	−0.0931931	−0.0119048	−0.0361088
3.54498	−0.0940945	−0.0117647	−0.0361149
3.59815	−0.0950137	−0.0116279	−0.0361253
3.65213	−0.0959507	−0.0114943	−0.0361398
3.70691	−0.0969058	−0.0113636	−0.0361583
3.76251	−0.097879	−0.011236	−0.0361808
3.81895	−0.0988704	−0.0111111	−0.0362072
3.87623	−0.0998802	−0.010989	−0.0362374
3.93438	−0.100908	−0.0108696	−0.0362712
3.99339	−0.101955	−0.0107527	−0.0363087
4.05329	−0.103021	−0.0106383	−0.0363497
4.11409	−0.104106	−0.0105263	−0.0363942
4.1758	−0.105209	−0.0104167	−0.036442
4.23844	−0.106332	−0.0103093	−0.0364932
4.30202	−0.107475	−0.0102041	−0.0365477
4.36655	−0.108637	−0.010101	−0.0366054
4.43205	−0.109819	−0.01	−0.0366663
4.49853	−0.111021	−0.00990099	−0.0367303
4.566	−0.112243	−0.00980392	−0.0367973
4.63449	−0.113485	−0.00970874	−0.0368674
4.70401	−0.114748	−0.00961538	−0.0369404
4.77457	−0.116032	−0.00952381	−0.0370163
4.84619	−0.117337	−0.00943396	−0.0370951
4.91888	−0.118664	−0.00934579	−0.0371767
4.99267	−0.120012	−0.00925926	−0.0372611
5.06756	4.94618	0.990826	2.21378
5.14357	−0.0467597	−0.00909091	−0.0206177
5.22072	−0.0470335	−0.00900901	−0.0205846
5.29903	−0.0473128	−0.00892857	−0.0205532
5.37852	−0.0475975	−0.00884956	−0.0205236
5.4592	−0.0478877	−0.00877193	−0.0204955
5.54109	−0.0481834	−0.00869565	−0.0204691

```
5.6242     -0.0484845    -0.00862069    -0.0204443
5.70856    -0.0487912    -0.00854701    -0.020421
5.79419    -0.0491033    -0.00847458    -0.0203993
5.88111    -0.0494211    -0.00840336    -0.020379
5.96932    -0.0497444    -0.00833333    -0.0203602
6.05886    -0.0500732    -0.00826446    -0.0203428
6.14975    -0.0504078    -0.00819672    -0.0203268
6.24199    -0.0507479    -0.00813008    -0.0203122
6.33562    -0.0510937    -0.00806452    -0.0202989
6.43066    -0.0514452    -0.008         -0.020287
6.52712    -0.0518025    -0.00793651    -0.0202764
6.62502    -0.0521655    -0.00787402    -0.020267
6.7244     -0.0525344    -0.0078125     -0.0202589
6.82526    -0.052909     -0.00775194    -0.0202521
6.92764    -0.0532896    -0.00769231    -0.0202465
7.03156    -0.053676     -0.00763359    -0.020242
7.13703    -0.0540684    -0.00757576    -0.0202388
7.24409    -0.0544668    -0.0075188     -0.0202367
7.35275    -0.0548713    -0.00746269    -0.0202358
7.46304    -0.0552818    -0.00740741    -0.020236
7.57498    -0.0556984    -0.00735294    -0.0202373
7.68861    -0.0561212    -0.00729927    -0.0202397
7.80394    -0.0565503    -0.00724638    -0.0202431
7.921      -0.0569856    -0.00719424    -0.0202477
8.03981    -0.0574272    -0.00714286    -0.0202533
8.16041    -0.0578752    -0.0070922     -0.0202599
8.28282    -0.0583297    -0.00704225    -0.0202675
8.40706    -0.0587906    -0.00699301    -0.0202762
8.53316    -0.0592581    -0.00694444    -0.0202858
8.66116    -0.0597321    -0.00689655    -0.0202964
8.79108    -0.0602129    -0.00684932    -0.0203081
8.92294    -0.0607003    -0.00680272    -0.0203206
9.05679    -0.0611945    -0.00675676    -0.0203341
9.19264    -0.0616956    -0.00671141    -0.0203486
9.33053    -0.0622035    -0.00666667    -0.0203639
9.47049    -0.0627185    -0.00662252    -0.0203802
9.61255    -0.0632404    -0.00657895    -0.0203974
9.75673    -0.0637695    -0.00653595    -0.0204155
9.90308    -0.0643057    -0.00649351    -0.0204345
```

```
DiscretePlot[((-1)^(k + 1) E2ax[10, k, 1.015, 0] + 1) / k, {k, 1, Log[1.015, 10]}]
```



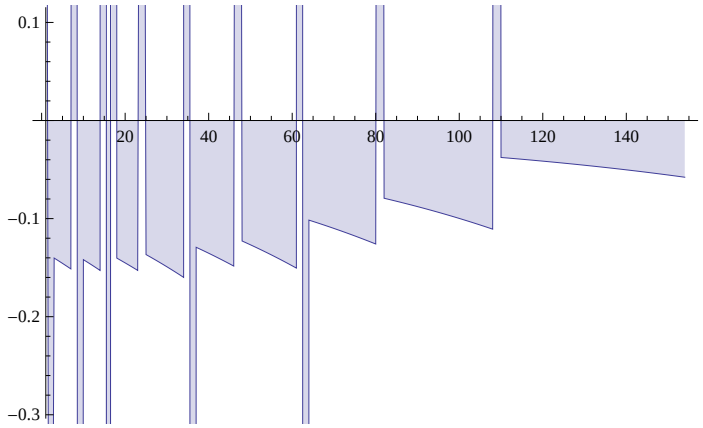
```
Table[{10 / 1.015^k, ((-1)^(k + 1) E2ax[10, k, 1.015, 0] + 1) / k},
  {k, 1, Log[1.015, 10]}] // TableForm
```

9.85222	1.
9.70662	−1.
9.56317	0.
9.42184	0.
9.2826	0.
9.14542	0.
9.01027	0.
8.87711	4.5
8.74592	−4.
8.61667	0.
8.48933	0.
8.36387	0.
8.24027	0.
8.11849	0.
7.99852	45.3333
7.88031	−85.
7.76385	40.
7.64912	0.
7.53607	0.
7.4247	0.
7.31498	0.
7.20688	0.
7.10037	0.
6.99544	1.
6.89206	0.
6.79021	0.
6.68986	0.
6.59099	0.
6.49359	0.
6.39762	0.
6.30308	0.
6.20993	0.
6.11816	0.
6.02774	0.
5.93866	35.
5.8509	−35.
5.76443	0.
5.67924	0.
5.59531	0.
5.51262	0.
5.43116	0.
5.35089	0.
5.27182	0.
5.19391	0.
5.11715	0.
5.04153	0.
4.96702	1.
4.89362	0.
4.8213	0.
4.75005	0.
4.67985	0.
4.61069	0.
4.54255	0.
4.47542	0.

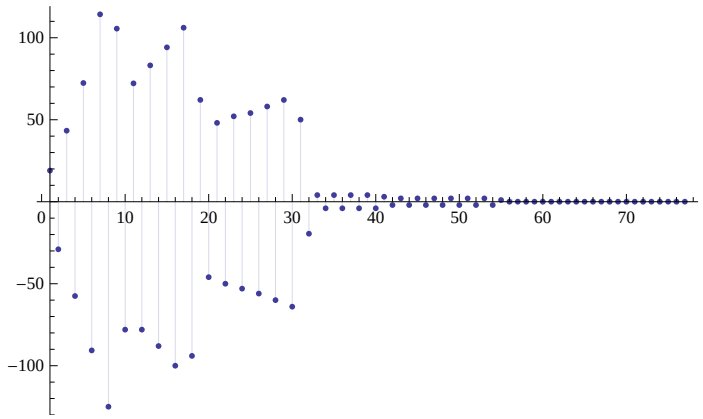
```
4.40928    0.
4.34412    0.
4.27992    0.
4.21667    0.
4.15435    0.
4.09296    0.
4.03247    0.
3.97288    31.5
3.91417    -31.
3.85632    0.
3.79933    0.
3.74318    0.
3.68787    0.
3.63337    0.
3.57967    0.
3.52677    0.
3.47465    0.
3.4233     0.
3.37271    0.
3.32287    0.
3.27376    0.
3.22538    0.
3.17771    0.
3.13075    0.
3.08448    0.
3.0389     0.
2.99399    1.
2.94975    0.
2.90615    0.
2.86321    0.
2.82089    0.
2.7792     0.
2.73813    0.
2.69767    0.
2.6578     0.
2.61852    0.
2.57982    0.
2.5417     0.
2.50414    0.
2.46713    0.
2.43067    0.
2.39475    0.
2.35936    0.
2.32449    0.
2.29014    0.
2.25629    0.
2.22295    0.
2.1901     0.
2.15773    0.
2.12585    0.
2.09443    0.
2.06348    0.
2.03298    0.
2.00294    0.
1.97334    1.
1.94417    0.
```

```
1.91544    0.
1.88714    0.
1.85925    0.
1.83177    0.
1.8047     0.
1.77803    0.
1.75175    0.
1.72587    0.
1.70036    0.
1.67523    0.
1.65047    0.
1.62608    0.
1.60205    0.
1.57838    0.
1.55505    0.
1.53207    0.
1.50943    0.
1.48712    0.
1.46514    0.
1.44349    0.
1.42216    0.
1.40114    0.
1.38044    0.
1.36004    0.
1.33994    0.
1.32013    0.
1.30063    0.
1.2814     0.
1.26247    0.
1.24381    0.
1.22543    0.
1.20732    0.
1.18948    0.
1.1719     0.
1.15458    0.
1.13752    0.
1.12071    0.
1.10414    0.
1.08783    0.
1.07175    0.
1.05591    0.
1.04031    0.
1.02493    0.
1.00979    0.
```

```
DiscretePlot[((-1)^(k+1) E2ax[10, k, 1.015, 1] + 1) / k, {k, 1, Log[1.015, 10]}]
```




```
DiscretePlot[((-1)^(k+1) E2ay[10, k, 1.03, 0] + 1) / k, {k, 1, Log[1.03, 10]}]
```




```
Table[{10 / 1.03^k, ((-1)^(k+1) E2ay[10, k, 1.03, 0] + 1) / k},
  {k, 1, Log[1.03, 10]}] // TableForm
```

```
9.70874    19.
9.42596    -29.
9.15142    43.3333
8.88487    -57.5
8.62609    72.4
8.37484    -90.6667
8.13092    114.286
7.89409    -125.
7.66417    105.556
7.44094    -78.
7.22421    72.1818
7.0138     -78.
6.80951    83.1538
6.61118    -88.
6.41862    94.1333
6.23167    -100.
6.05016    106.118
5.87395    -94.
5.70286    62.1053
5.53676    -46.
5.37549    48.0952
```

```
5.21893    -50.
5.06692    52.087
4.91934    -53.
4.77606    54.08
4.63695    -56.
4.50189    58.0741
4.37077    -60.
4.24346    62.069
4.11987    -64.
3.99987    50.0645
3.88337    -19.5
3.77026    4.06061
3.66045    -4.
3.55383    4.05714
3.45032    -4.
3.34983    4.05405
3.25226    -4.
3.15754    4.05128
3.06557    -4.
2.97628    3.04878
2.88959    -2.
2.80543    2.04651
2.72372    -2.
2.64439    2.04444
2.56737    -2.
2.49259    2.04255
2.41999    -2.
2.3495     2.04082
2.28107    -2.
2.21463    2.03922
2.15013    -2.
2.0875     2.03774
2.0267     -2.
1.96767    1.03636
1.91036    0.
1.85472    0.0350877
1.8007     0.
1.74825    0.0338983
1.69733    0.
1.64789    0.0327869
1.5999     0.
1.5533     0.031746
1.50806    0.
1.46413    0.0307692
1.42149    0.
1.38009    0.0298507
1.33989    0.
1.30086    0.0289855
1.26297    0.
1.22619    0.028169
1.19047    0.
1.1558     0.0273973
1.12214    0.
1.08945    0.0266667
1.05772    0.
1.02691    0.025974
```