```
\texttt{p[n\_]} \; := \; \texttt{Sum[1/jPrimePi[n^(1/j)], \{j, 1, \, Log[2, \, n]\}]}
\label{eq:discretePlot} \mbox{DiscretePlot[} \left[ \mbox{LogIntegral[} n\mbox{] - p[} n\mbox{], 1 / (8 Pi) } n^{\wedge} (1 \mbox{/ 2) Log[} n\mbox{],} \right.
    -1/(8 Pi) n^{(1/2) Log[n]}, \{n, 1, 1000000000, 1000000\}]
 20 000
 10 000
                                                           2\times10^8
                                                                                                                      4 \times 10^8
-10 000
-20 000
```

```
DiscretePlot[ {LogIntegral[n] - PrimePi[n],
    1 / (8 Pi) n^ (1/2) Log[n], -1 / (8 Pi) n^ (1/2) Log[n]}, {n, 1, 10 000}]

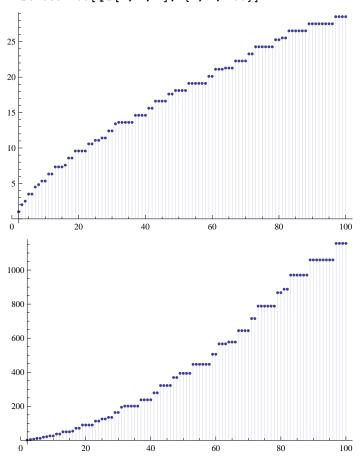
30
20
20
2000
4000
6000
8000
10000

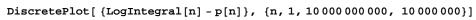
Ppp[n_, j_, k_] :=
    pp[n, j, k] = If[n < j, 0, 1/k - pp[Floor[n/j], 2, k+1] + pp[n, j+1, k]]
    pp[100, 2, 1]

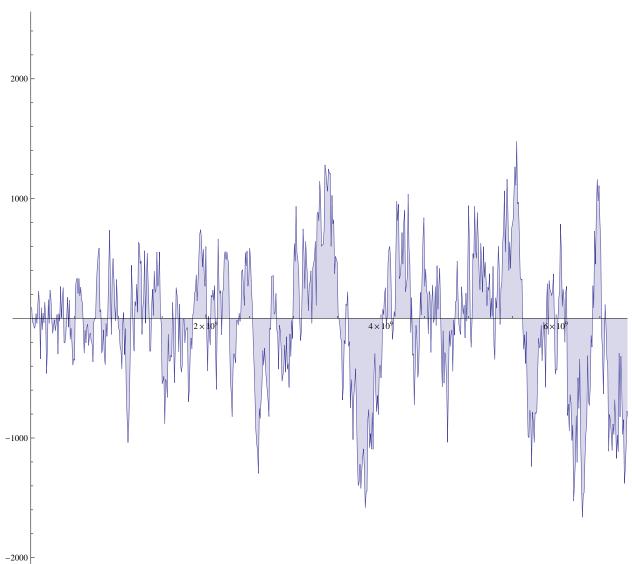
428
15
```

 $ps[n_-, j_-, k_-] := If[n < j, 0, j(1/k - ps[Floor[n/j], 2, k+1]) + ps[n, j+1, k]]$ 

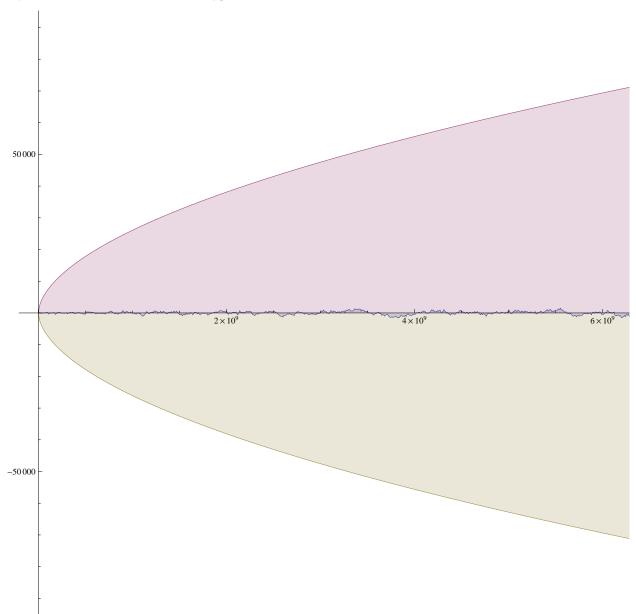
 $\texttt{DiscretePlot[pp[n, 2, 1], \{n, 2, 100\}]}$ DiscretePlot[ ps[n, 2, 1], {n, 2, 100}]

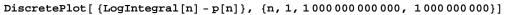


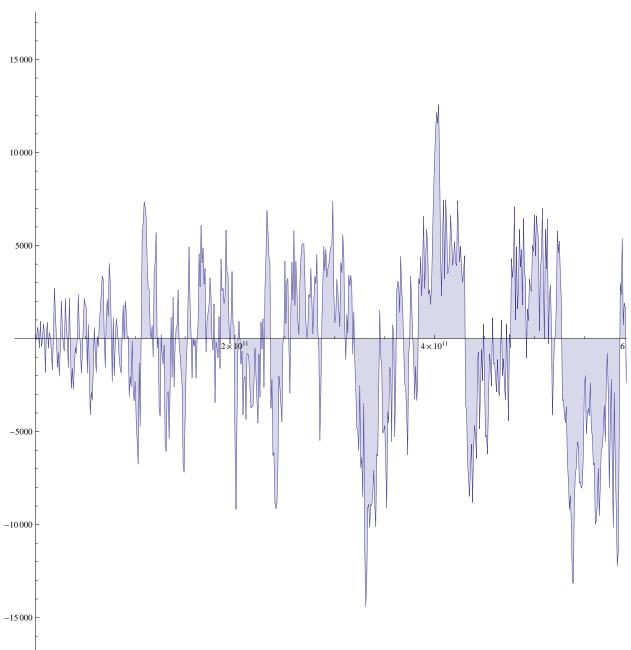




{n, 1, 10000000000, 10000000}]







LogIntegral[17.] - Log[Log[17]] - EulerGamma

 $\label{eq:primeK} \begin{aligned} \text{PrimeK}[n\_] &:= \text{If}[n == 1, \, 0, \, \text{FullSimplify}[\texttt{MangoldtLambda}[n] \, / \, \text{Log}[n]]] \end{aligned}$  $\label{eq:linnik} \text{Linnik}[n\_,\,k\_] := 1 \, / \, k \, - \, \text{Sum}[\text{If}[j = 1 \, | \, | \, n = j,\, 0\,,\, \text{Linnik}[j,\,k+1]]\,,\, \{j,\, \text{Divisors}[n]\}]$  $\texttt{Table}[\{\texttt{n},\, \texttt{PrimeK}[\texttt{n}]\,,\, \texttt{Linnik}[\texttt{n},\, \texttt{1}]\,\}\,,\, \{\texttt{n},\, \texttt{2},\, \texttt{100}\}]\,\,//\,\, \texttt{TableForm}$ 

```
2
       1
             1
3
       1
             1
4
5
             1
```

7.25784

6	0	0
7	1	1
6 7 8	1	1
9	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
	2	2
10	0	0
11	1	Ţ
12	0	0
13	1	Τ
12 13 14 15	0	0
15	0	0
16	<u>+</u>	
17	1	1
18	0	0
19	1	1
20	0	0
21	0	0
22	0	0
23	1	1
24	0	0
25	1	1
26	2 0	2
21 22 23 24 25 26 27	1	1
	3	3
28	0	0
29	1	1
30	0	0
31	1	1
32	<u>1</u> 5	1 5
33 34	0	0
34	0	0
35	0	0
35 36	0	0
37	1	1
38	0	0
38 39 40 41	0	0
40	0	0
41	1	1
42	0	0
43	1	1
44	0	0
45	0	0
46	0	0
47	1	1
48	0	0
49	$\frac{1}{2}$	$\frac{1}{2}$
50	0	0
51	0	0
52	0	0
53	1	1
54	0	0
55	0	0
56	0	0
57	0	0
58	0	0

```
59
                1
60
         0
                0
61
         1
                1
62
63
         0
                0
64
65
                0
66
         0
                0
67
         1
                1
68
69
         0
                0
70
         0
                0
71
72
         0
               0
73
         1
               1
74
75
         0
                0
76
         0
                0
77
78
         0
                0
79
         1
                1
80
81
82
         0
                0
83
               1
84
         0
                0
85
         0
                0
86
87
         0
                0
88
         0
                0
89
                1
90
         0
                0
91
         0
               0
92
93
         0
                0
94
         0
                0
95
         0
                0
96
         0
               0
97
         1
               1
98
99
         0
               0
100
\label{eq:primeK} \begin{aligned} \text{PrimeK}[n\_] := & \text{If}[n = 1, \, 0, \, \text{FullSimplify}[\texttt{MangoldtLambda}[n] \, / \, \text{Log}[n]]] \end{aligned}
d[n_{x}] := Product[Pochhammer[z, a = p[[2]]] / a!, {p, FI[n]}];
FI[n_] := FactorInteger[n]; FI[1] := {}
\label{eq:table_energy} \texttt{Table}[\{n,\,\texttt{D}[d[n,\,z]\,,\,z]\,\,/.\,\,z\rightarrow0\,,\,\texttt{PrimeK}[n]\}\,,\,\{n,\,2,\,100\}]\,\,//\,\,\texttt{TableForm}
               1
3
         1
               1
4
5
               1
6
         0
               0
                1
         1
```

8	1	1
O	3	3
9	1 2	
10	0	0
	1	1
11 12 13	0	_
12	1	1
13	Ţ	Ţ
14	0	0
15	0	0
16	1/4	1
17	$     \begin{array}{c}       \frac{1}{3} \\       \frac{1}{2} \\       0 \\       1 \\       0 \\       1 \\       0 \\       0 \\       1 \\       0 \\   $	1
18	0	0
19	1	1
20	_	
21	0	0
21	0	0
22	0	0
20 21 22 23 24	1	1
24	0	0
25	1/2	1
26	0	0
26 27	1	1
27	3	3
28 29	0	0
29	1	1
30	0	0
30 31	1	1
32	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
33	5 0	5 0
34	0	0
25	0	0
35	0	0
36 37	1	1
3/		Τ
38	0	0
39 40 41 42	0	0
40	0	0
41	1	1
42		
43	1	1
44	0	0
45	0	0
46	0	0
47	1	1
48	0	0
49	$\frac{1}{2}$	$\frac{1}{2}$
50	2 0	2
51	0	0
52	0	0
53	1	1
54	0	0
55	0	0
56	0	0
57	0	0
58	0	0
59	1	1
60	0	0

61	1	1
62	0	0
63	0	0
64	$\frac{1}{6}$	$\frac{1}{6}$ 0
65	0	0
66	0	0
67	1	1
68	1 0 0 0	1 0 0
69 70	0	0
70	0	0
71	1	1
72	0	0
73	1	1
74	0	0
75 76	0 0 0	0
76	0	0
77	0	0
78 79	0	0 1 0 <u>1</u>
79	1 0	1
80	0	0
81	1	$\frac{1}{4}$
82	0	0
83	1	1
84	-4 0 1 0	0 1 0
85	0	0
86	0	0
87	0	0
88	0	0
89	1	1
90	0	0
91	0	0
92	0 0 0	0
93	0	0
94	0	0
95	0	0
96	0	0
97	1 0 0 0	1 0 0
98	0	0
99	0	0
100	0	0