

```

DD[n_, k_] := Sum[ DD[Floor[n / j], k - 1], {j, 2, n}]
DD[n_, 0] := 1
PI[n_] := Sum[ (-1) ^ (k + 1) / k DD[n, k], {k, 1, Log[n] / Log[2]}]
PI[100]

428
15

PI[n_, k_] := Sum[ 1 / k - PI[Floor[n / j], k + 1], {j, 2, n}]
PI[n_] := PI[n, 1]
PI[100]

428
15

PI[n_, j_, k_] := 1 / k - PI[Floor[n / j], Floor[n / j], k + 1] + PI[n, j - 1, k]
PI[n_, 1, k_] := 0
PI[n_] := PI[n, n, 1]

PI[96]

413
15

Kappa[n_] := N[MangoldtLambda[n] / Log[n]]
F[n_, k_] := Sum[ Kappa[j] (1 / (k!)) + F[Floor[n / j], k + 1], {j, 2, n}]
F[n_] := F[n, 1]
F[108]

107.

Kappa[6]

0.

Kappa[n_] := N[MangoldtLambda[n] / Log[n]]
F[n_, j_, k_] := Kappa[j] (1 / (k!)) + F[Floor[n / j], k + 1] + F[n, j - 1, k]
F[n_, 1, k_] := 0
F[n_] := F[n, n, 1]
F[107]

106.

DivisorSum[20, f, PrimeQ]

f[2] + f[5]

PrimeQ[7]

True

DivisorSum[n, Sin[Pi #1 / 2] &]

1
- SquaresR[2, n]
4

Divisors[300]

{1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 25, 30, 50, 60, 75, 100, 150, 300}

```

```

Sum[ j, {j, Divisors[10]}]

18

Divisors[10]

{1, 2, 5, 10}

dp[n_, k_] := Sum[ dp[j, k - 1] dp[n / j, 1], {j, Divisors[n]}]
dp[n_, 1] := If[n < 2, 0, 1]
Kappa[n_] := Sum[ (-1)^(k + 1) / k dp[n, k], {k, 1, N[Log[n] / Log[2]]}]
Kappa[12]

0

DD[8, 2]

2

Table[ Kappa[j], {j, 2, 21}]

{1, 1,  $\frac{1}{2}$ , 1, 0, 1,  $\frac{1}{3}$ ,  $\frac{1}{2}$ , 0, 1, 0, 1, 0, 0,  $\frac{1}{4}$ , 1, 0, 1, 0, 0}

pd[n_, k_] := Sum[ pd[j, k - 1] pd[n / j, 1], {j, Divisors[n]}]
pd[n_, 1] := Kappa[n]
InvKappa[n_] := Sum[ 1 / (k!) pd[n, k], {k, 1, N[Log[n] / Log[2]]}]
Kappa2[9]

1

Table[InvKappa[n], {n, 2, 21}]

{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1}

InvKappa[1]

0

PI[n_] := Sum[ 1 / k PrimePi[Floor[n^(1 / k)]], {k, 1, N[Log[n] / Log[2]]}]
PP[n_] := Sum[ MoebiusMu[k] 1 / k PI[Floor[n^(1 / k)]], {k, 1, N[Log[n] / Log[2]]}]
FactorInteger[9000]

{{2, 3}, {3, 2}, {5, 3}}

Product[ j, {j, FactorInteger[9000]}]

{30, 18}

Length[FactorInteger[9000]]

3

FactorInteger[9000][[2]][[1]]

3

DDD[n_, z_] :=
  1 / z Product[ 1 / (FactorInteger[n][[j]][[2]]!) Pochhammer[z, FactorInteger[n][[j]][[2]]],
    {j, 1, Length[FactorInteger[n]]}]

```

```
PI2[n_] := N[Sum[DDD[j, 10^(-120)], {j, 2, n}]]
```

```
PI2[100]
```

```
28.5333
```

```
Table[Round[N[DDD[n, 10^-120]], .0000001], {n, 2, 100}]
```

```
{1., 1., 0.5, 1., 0., 1., 0.333333, 0.5, 0., 1., 0., 1., 0., 0., 0.25, 1., 0., 1.,
 0., 0., 0., 1., 0., 0.5, 0., 0.333333, 0., 1., 0., 1., 0.2, 0., 0., 0., 1., 0.,
 0., 0., 1., 0., 1., 0., 0., 0., 1., 0., 0.5, 0., 0., 0., 1., 0., 0., 0., 0., 1.,
 0., 1., 0., 0., 0.166667, 0., 0., 1., 0., 0., 0., 1., 0., 1., 0., 0., 0., 0., 1.,
 0., 0.25, 0., 1., 0., 0., 0., 0., 0., 1., 0., 0., 0., 0., 0., 0., 1., 0., 0., 0.}
```

```
FactInteger[n_] := If[n == 1, {}, FactorInteger[n]]
```

```
dd[n_, z_] := Product[1/(j[[2]]!) Pochhammer[z, j[[2]]], {j, FactInteger[n]}]
```

```
Dd[101, .00001]
```

```
0.00001
```

```
PrimeKappa[n_] := N[MangoldtLambda[n] / Log[n]]
```

```
FactInteger[n_] := If[n == 1, {}, FactorInteger[n]]
```

```
d[n_, z_] := Product[1/(j[[2]]!) Pochhammer[z, j[[2]]], {j, FactInteger[n]}]
```

```
Limitd[n_, z_] := Round[N[1/z d[n, z]], .0000001]
```

```
Table[{n, Limitd[n, 10^(-120)], PrimeKappa[n]}, {n, 2, 100}] // TableForm
```

2	1.	1.
3	1.	1.
4	0.5	0.5
5	1.	1.
6	0.	0.
7	1.	1.
8	0.333333	0.333333
9	0.5	0.5
10	0.	0.
11	1.	1.
12	0.	0.
13	1.	1.
14	0.	0.
15	0.	0.
16	0.25	0.25
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	0.5	0.5
26	0.	0.
27	0.333333	0.333333
28	0.	0.
29	1.	1.
30	0.	0.
31	1.	1.
32	0.2	0.2
33	0.	0.

34	0.	0.
35	0.	0.
36	0.	0.
37	1.	1.
38	0.	0.
39	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	0.5	0.5
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.	1.
60	0.	0.
61	1.	1.
62	0.	0.
63	0.	0.
64	0.166667	0.166667
65	0.	0.
66	0.	0.
67	1.	1.
68	0.	0.
69	0.	0.
70	0.	0.
71	1.	1.
72	0.	0.
73	1.	1.
74	0.	0.
75	0.	0.
76	0.	0.
77	0.	0.
78	0.	0.
79	1.	1.
80	0.	0.
81	0.25	0.25
82	0.	0.
83	1.	1.
84	0.	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.
93	0.	0.
94	0.	0.
95	0.	0.
96	0.	0.
97	1.	1.
98	0.	0.
99	0.	0.
100	0.	0.

PI[n\_] := N[Sum[Dd[j, 10^(-120)], {j, 2, n}]]

PI2[100]

28.5333

Dd[n\_, z\_] := Product[1 / (a[[2]]!) Pochhammer[z, a[[2]]], {a, FactorInteger[n]}]

Dd[102, .000000001]

$1. \times 10^{-27}$

Round[.000000000001, .000000001]

0.

RiemannPrimeCounting[n\_] := Sum[PrimePi[n^(1/j)] / j, {j, 1, N[Log[n] / Log[2]]}]

FactInteger[n\_] := If[n == 1, {}, FactorInteger[n]]

d[n\_, z\_] := Product[1 / (j[[2]]!) Pochhammer[z, j[[2]]], {j, FactInteger[n]}]

DD[n\_, z\_] := Sum[d[j, z], {j, 1, n}]

LimitD[n\_, z\_] := 1 / z (DD[n, z] - 1)

Table[{n, N[LimitD[n, 10^(-120)]], N[RiemannPrimeCounting[n]]}, {n, 1, 100}] //

TableForm

1	0.	0.
2	1.	1.
3	2.	2.
4	2.5	2.5
5	3.5	3.5
6	3.5	3.5
7	4.5	4.5
8	4.83333	4.83333
9	5.33333	5.33333
10	5.33333	5.33333
11	6.33333	6.33333
12	6.33333	6.33333
13	7.33333	7.33333
14	7.33333	7.33333
15	7.33333	7.33333
16	7.58333	7.58333
17	8.58333	8.58333
18	8.58333	8.58333
19	9.58333	9.58333
20	9.58333	9.58333
21	9.58333	9.58333
22	9.58333	9.58333

23	10.5833	10.5833
24	10.5833	10.5833
25	11.0833	11.0833
26	11.0833	11.0833
27	11.4167	11.4167
28	11.4167	11.4167
29	12.4167	12.4167
30	12.4167	12.4167
31	13.4167	13.4167
32	13.6167	13.6167
33	13.6167	13.6167
34	13.6167	13.6167
35	13.6167	13.6167
36	13.6167	13.6167
37	14.6167	14.6167
38	14.6167	14.6167
39	14.6167	14.6167
40	14.6167	14.6167
41	15.6167	15.6167
42	15.6167	15.6167
43	16.6167	16.6167
44	16.6167	16.6167
45	16.6167	16.6167
46	16.6167	16.6167
47	17.6167	17.6167
48	17.6167	17.6167
49	18.1167	18.1167
50	18.1167	18.1167
51	18.1167	18.1167
52	18.1167	18.1167
53	19.1167	19.1167
54	19.1167	19.1167
55	19.1167	19.1167
56	19.1167	19.1167
57	19.1167	19.1167
58	19.1167	19.1167
59	20.1167	20.1167
60	20.1167	20.1167
61	21.1167	21.1167
62	21.1167	21.1167
63	21.1167	21.1167
64	21.2833	21.2833
65	21.2833	21.2833
66	21.2833	21.2833
67	22.2833	22.2833
68	22.2833	22.2833
69	22.2833	22.2833
70	22.2833	22.2833
71	23.2833	23.2833
72	23.2833	23.2833
73	24.2833	24.2833
74	24.2833	24.2833
75	24.2833	24.2833
76	24.2833	24.2833
77	24.2833	24.2833
78	24.2833	24.2833

79	25.2833	25.2833
80	25.2833	25.2833
81	25.5333	25.5333
82	25.5333	25.5333
83	26.5333	26.5333
84	26.5333	26.5333
85	26.5333	26.5333
86	26.5333	26.5333
87	26.5333	26.5333
88	26.5333	26.5333
89	27.5333	27.5333
90	27.5333	27.5333
91	27.5333	27.5333
92	27.5333	27.5333
93	27.5333	27.5333
94	27.5333	27.5333
95	27.5333	27.5333
96	27.5333	27.5333
97	28.5333	28.5333
98	28.5333	28.5333
99	28.5333	28.5333
100	28.5333	28.5333

**Dd[1, 4]**

1

**FactInteger[1]**

{}

**RiemannPrimeCounting[n\_] := Sum[ PrimePi[ n^(1 / j) ] / j, {j, 1, N[Log[n] / Log[2]]}]**

**DD[n\_, k\_] := Sum[DD[Floor[n / j], k - 1], {j, 2, n}]**

**DD[n\_, 0] := 1**

**PI[n\_] := Sum[ (-1) ^ (k + 1) / k DD[n, k], {k, 1, N[Log[n] / Log[2]]}]**

**Table[{ n, PI[n], RiemannPrimeCounting[n]}, {n, 1, 100}] // TableForm**

1	0	0
2	1	1
3	2	2
4	$\frac{5}{2}$	$\frac{5}{2}$
5	$\frac{7}{2}$	$\frac{7}{2}$
6	$\frac{7}{2}$	$\frac{7}{2}$
7	$\frac{9}{2}$	$\frac{9}{2}$
8	$\frac{29}{6}$	$\frac{29}{6}$
9	$\frac{16}{3}$	$\frac{16}{3}$
10	$\frac{16}{3}$	$\frac{16}{3}$
11	$\frac{19}{3}$	$\frac{19}{3}$
12	$\frac{19}{3}$	$\frac{19}{3}$
13	$\frac{22}{3}$	$\frac{22}{3}$
14	$\frac{22}{3}$	$\frac{22}{3}$
15	$\frac{22}{3}$	$\frac{22}{3}$

	~	~
16	<u>91</u>	<u>91</u>
	12	12
17	<u>103</u>	<u>103</u>
	12	12
18	<u>103</u>	<u>103</u>
	12	12
19	<u>115</u>	<u>115</u>
	12	12
20	<u>115</u>	<u>115</u>
	12	12
21	<u>115</u>	<u>115</u>
	12	12
22	<u>115</u>	<u>115</u>
	12	12
23	<u>127</u>	<u>127</u>
	12	12
24	<u>127</u>	<u>127</u>
	12	12
25	<u>133</u>	<u>133</u>
	12	12
26	<u>133</u>	<u>133</u>
	12	12
27	<u>137</u>	<u>137</u>
	12	12
28	<u>137</u>	<u>137</u>
	12	12
29	<u>149</u>	<u>149</u>
	12	12
30	<u>149</u>	<u>149</u>
	12	12
31	<u>161</u>	<u>161</u>
	12	12
32	<u>817</u>	<u>817</u>
	60	60
33	<u>817</u>	<u>817</u>
	60	60
34	<u>817</u>	<u>817</u>
	60	60
35	<u>817</u>	<u>817</u>
	60	60
36	<u>817</u>	<u>817</u>
	60	60
37	<u>877</u>	<u>877</u>
	60	60
38	<u>877</u>	<u>877</u>
	60	60
39	<u>877</u>	<u>877</u>
	60	60
40	<u>877</u>	<u>877</u>
	60	60
41	<u>937</u>	<u>937</u>
	60	60
42	<u>937</u>	<u>937</u>
	60	60
43	<u>997</u>	<u>997</u>
	60	60
44	<u>997</u>	<u>997</u>
	60	60
45	<u>997</u>	<u>997</u>
	60	60
46	<u>997</u>	<u>997</u>
	60	60
47	<u>1057</u>	<u>1057</u>
	60	60
48	<u>1057</u>	<u>1057</u>
	60	60
49	<u>1087</u>	<u>1087</u>
	60	60
50	<u>1087</u>	<u>1087</u>
	60	60
51	<u>1087</u>	<u>1087</u>
	60	60
52	<u>1087</u>	<u>1087</u>
	60	60
53	<u>1147</u>	<u>1147</u>
	60	60
54	<u>1147</u>	<u>1147</u>
	60	60



	--	--
55	<u>1147</u>	<u>1147</u>
	60	60
	<u>1147</u>	<u>1147</u>
56	<u>60</u>	<u>60</u>
	<u>1147</u>	<u>1147</u>
57	<u>60</u>	<u>60</u>
	<u>1147</u>	<u>1147</u>
58	<u>60</u>	<u>60</u>
	<u>1207</u>	<u>1207</u>
59	<u>60</u>	<u>60</u>
	<u>1207</u>	<u>1207</u>
60	<u>60</u>	<u>60</u>
	<u>1267</u>	<u>1267</u>
61	<u>60</u>	<u>60</u>
	<u>1267</u>	<u>1267</u>
62	<u>60</u>	<u>60</u>
	<u>1267</u>	<u>1267</u>
63	<u>60</u>	<u>60</u>
	<u>1277</u>	<u>1277</u>
64	<u>60</u>	<u>60</u>
	<u>1277</u>	<u>1277</u>
65	<u>60</u>	<u>60</u>
	<u>1277</u>	<u>1277</u>
66	<u>60</u>	<u>60</u>
	<u>1337</u>	<u>1337</u>
67	<u>60</u>	<u>60</u>
	<u>1337</u>	<u>1337</u>
68	<u>60</u>	<u>60</u>
	<u>1337</u>	<u>1337</u>
69	<u>60</u>	<u>60</u>
	<u>1337</u>	<u>1337</u>
70	<u>60</u>	<u>60</u>
	<u>1397</u>	<u>1397</u>
71	<u>60</u>	<u>60</u>
	<u>1397</u>	<u>1397</u>
72	<u>60</u>	<u>60</u>
	<u>1457</u>	<u>1457</u>
73	<u>60</u>	<u>60</u>
	<u>1457</u>	<u>1457</u>
74	<u>60</u>	<u>60</u>
	<u>1457</u>	<u>1457</u>
75	<u>60</u>	<u>60</u>
	<u>1457</u>	<u>1457</u>
76	<u>60</u>	<u>60</u>
	<u>1457</u>	<u>1457</u>
77	<u>60</u>	<u>60</u>
	<u>1457</u>	<u>1457</u>
78	<u>60</u>	<u>60</u>
	<u>1517</u>	<u>1517</u>
79	<u>60</u>	<u>60</u>
	<u>1517</u>	<u>1517</u>
80	<u>60</u>	<u>60</u>
	<u>383</u>	<u>383</u>
81	<u>15</u>	<u>15</u>
	<u>383</u>	<u>383</u>
82	<u>15</u>	<u>15</u>
	<u>398</u>	<u>398</u>
83	<u>15</u>	<u>15</u>
	<u>398</u>	<u>398</u>
84	<u>15</u>	<u>15</u>
	<u>398</u>	<u>398</u>
85	<u>15</u>	<u>15</u>
	<u>398</u>	<u>398</u>
86	<u>15</u>	<u>15</u>
	<u>398</u>	<u>398</u>
87	<u>15</u>	<u>15</u>
	<u>398</u>	<u>398</u>
88	<u>15</u>	<u>15</u>
	<u>413</u>	<u>413</u>
89	<u>15</u>	<u>15</u>
	<u>413</u>	<u>413</u>
90	<u>15</u>	<u>15</u>
	<u>413</u>	<u>413</u>
91	<u>15</u>	<u>15</u>
	<u>413</u>	<u>413</u>
92	<u>15</u>	<u>15</u>
	<u>413</u>	<u>413</u>
93	<u>15</u>	<u>15</u>

	--	--
94	$\frac{413}{15}$	$\frac{413}{15}$
	$\frac{413}{15}$	$\frac{413}{15}$
95	$\frac{413}{15}$	$\frac{413}{15}$
	$\frac{413}{15}$	$\frac{413}{15}$
96	$\frac{413}{15}$	$\frac{413}{15}$
	$\frac{413}{15}$	$\frac{413}{15}$
97	$\frac{428}{15}$	$\frac{428}{15}$
	$\frac{428}{15}$	$\frac{428}{15}$
98	$\frac{428}{15}$	$\frac{428}{15}$
	$\frac{428}{15}$	$\frac{428}{15}$
99	$\frac{428}{15}$	$\frac{428}{15}$
	$\frac{428}{15}$	$\frac{428}{15}$
100	$\frac{428}{15}$	$\frac{428}{15}$

```
RiemannPrimeCounting[n_] := Sum[PrimePi[n^(1/j)]/j, {j, 1, N[Log[n]/Log[2]]}]
```

```
PI[n_, k_] := Sum[1/k - PI[Floor[n/j], k+1], {j, 2, n}]
```

```
Table[{n, PI[n, 1], RiemannPrimeCounting[n]}, {n, 1, 100}] // TableForm
```

1	0	0
2	1	1
3	2	2
4	$\frac{5}{2}$	$\frac{5}{2}$
5	$\frac{7}{2}$	$\frac{7}{2}$
6	$\frac{7}{2}$	$\frac{7}{2}$
7	$\frac{9}{2}$	$\frac{9}{2}$
8	$\frac{29}{6}$	$\frac{29}{6}$
9	$\frac{16}{3}$	$\frac{16}{3}$
10	$\frac{16}{3}$	$\frac{16}{3}$
11	$\frac{19}{3}$	$\frac{19}{3}$
12	$\frac{19}{3}$	$\frac{19}{3}$
13	$\frac{22}{3}$	$\frac{22}{3}$
14	$\frac{22}{3}$	$\frac{22}{3}$
15	$\frac{22}{3}$	$\frac{22}{3}$
16	$\frac{91}{12}$	$\frac{91}{12}$
17	$\frac{103}{12}$	$\frac{103}{12}$
18	$\frac{103}{12}$	$\frac{103}{12}$
19	$\frac{115}{12}$	$\frac{115}{12}$
20	$\frac{115}{12}$	$\frac{115}{12}$
21	$\frac{115}{12}$	$\frac{115}{12}$
22	$\frac{115}{12}$	$\frac{115}{12}$
23	$\frac{127}{12}$	$\frac{127}{12}$
24	$\frac{127}{12}$	$\frac{127}{12}$
25	$\frac{133}{12}$	$\frac{133}{12}$
26	$\frac{133}{12}$	$\frac{133}{12}$
27	$\frac{137}{12}$	$\frac{137}{12}$
28	$\frac{137}{12}$	$\frac{137}{12}$
29	$\frac{149}{12}$	$\frac{149}{12}$

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30	<u>149</u>	<u>149</u>
	12	12
31	<u>161</u>	<u>161</u>
	12	12
32	<u>817</u>	<u>817</u>
	60	60
33	<u>817</u>	<u>817</u>
	60	60
34	<u>817</u>	<u>817</u>
	60	60
35	<u>817</u>	<u>817</u>
	60	60
36	<u>817</u>	<u>817</u>
	60	60
37	<u>877</u>	<u>877</u>
	60	60
38	<u>877</u>	<u>877</u>
	60	60
39	<u>877</u>	<u>877</u>
	60	60
40	<u>877</u>	<u>877</u>
	60	60
41	<u>937</u>	<u>937</u>
	60	60
42	<u>937</u>	<u>937</u>
	60	60
43	<u>997</u>	<u>997</u>
	60	60
44	<u>997</u>	<u>997</u>
	60	60
45	<u>997</u>	<u>997</u>
	60	60
46	<u>997</u>	<u>997</u>
	60	60
47	<u>1057</u>	<u>1057</u>
	60	60
48	<u>1057</u>	<u>1057</u>
	60	60
49	<u>1087</u>	<u>1087</u>
	60	60
50	<u>1087</u>	<u>1087</u>
	60	60
51	<u>1087</u>	<u>1087</u>
	60	60
52	<u>1087</u>	<u>1087</u>
	60	60
53	<u>1147</u>	<u>1147</u>
	60	60
54	<u>1147</u>	<u>1147</u>
	60	60
55	<u>1147</u>	<u>1147</u>
	60	60
56	<u>1147</u>	<u>1147</u>
	60	60
57	<u>1147</u>	<u>1147</u>
	60	60
58	<u>1147</u>	<u>1147</u>
	60	60
59	<u>1207</u>	<u>1207</u>
	60	60
60	<u>1207</u>	<u>1207</u>
	60	60
61	<u>1267</u>	<u>1267</u>
	60	60
62	<u>1267</u>	<u>1267</u>
	60	60
63	<u>1267</u>	<u>1267</u>
	60	60
64	<u>1277</u>	<u>1277</u>
	60	60
65	<u>1277</u>	<u>1277</u>
	60	60
66	<u>1277</u>	<u>1277</u>
	60	60
67	<u>1337</u>	<u>1337</u>
	60	60
68	<u>1337</u>	<u>1337</u>
	60	60

69	$\frac{1337}{60}$	$\frac{1337}{60}$
70	$\frac{1337}{60}$	$\frac{1337}{60}$
71	$\frac{1397}{60}$	$\frac{1397}{60}$
72	$\frac{1397}{60}$	$\frac{1397}{60}$
73	$\frac{1457}{60}$	$\frac{1457}{60}$
74	$\frac{1457}{60}$	$\frac{1457}{60}$
75	$\frac{1457}{60}$	$\frac{1457}{60}$
76	$\frac{1457}{60}$	$\frac{1457}{60}$
77	$\frac{1457}{60}$	$\frac{1457}{60}$
78	$\frac{1457}{60}$	$\frac{1457}{60}$
79	$\frac{1517}{60}$	$\frac{1517}{60}$
80	$\frac{1517}{60}$	$\frac{1517}{60}$
81	$\frac{383}{15}$	$\frac{383}{15}$
82	$\frac{383}{15}$	$\frac{383}{15}$
83	$\frac{398}{15}$	$\frac{398}{15}$
84	$\frac{398}{15}$	$\frac{398}{15}$
85	$\frac{398}{15}$	$\frac{398}{15}$
86	$\frac{398}{15}$	$\frac{398}{15}$
87	$\frac{398}{15}$	$\frac{398}{15}$
88	$\frac{398}{15}$	$\frac{398}{15}$
89	$\frac{413}{15}$	$\frac{413}{15}$
90	$\frac{413}{15}$	$\frac{413}{15}$
91	$\frac{413}{15}$	$\frac{413}{15}$
92	$\frac{413}{15}$	$\frac{413}{15}$
93	$\frac{413}{15}$	$\frac{413}{15}$
94	$\frac{413}{15}$	$\frac{413}{15}$
95	$\frac{413}{15}$	$\frac{413}{15}$
96	$\frac{413}{15}$	$\frac{413}{15}$
97	$\frac{428}{15}$	$\frac{428}{15}$
98	$\frac{428}{15}$	$\frac{428}{15}$
99	$\frac{428}{15}$	$\frac{428}{15}$
100	$\frac{428}{15}$	$\frac{428}{15}$

```
RiemannPrimeCounting[n_] := Sum[PrimePi[n^(1/j)]/j, {j, 1, N[Log[n]/Log[2]]}]
```

```
PI[n_, j_, k_] := 1/k - PI[Floor[n/j], Floor[n/j], k+1] + PI[n, j-1, k]
```

```
PI[n_, 1, k_] := 0
```

```
Table[{n, PI[n, n, 1], RiemannPrimeCounting[n]}, {n, 1, 100}] // TableForm
```

1	0	0
2	1	1
3	2	2

4	$\frac{5}{2}$	$\frac{5}{2}$
5	$\frac{7}{2}$	$\frac{7}{2}$
6	$\frac{7}{2}$	$\frac{7}{2}$
7	$\frac{9}{2}$	$\frac{9}{2}$
8	$\frac{29}{6}$	$\frac{29}{6}$
9	$\frac{16}{3}$	$\frac{16}{3}$
10	$\frac{16}{3}$	$\frac{16}{3}$
11	$\frac{19}{3}$	$\frac{19}{3}$
12	$\frac{19}{3}$	$\frac{19}{3}$
13	$\frac{22}{3}$	$\frac{22}{3}$
14	$\frac{22}{3}$	$\frac{22}{3}$
15	$\frac{22}{3}$	$\frac{22}{3}$
16	$\frac{91}{12}$	$\frac{91}{12}$
17	$\frac{103}{12}$	$\frac{103}{12}$
18	$\frac{103}{12}$	$\frac{103}{12}$
19	$\frac{115}{12}$	$\frac{115}{12}$
20	$\frac{115}{12}$	$\frac{115}{12}$
21	$\frac{115}{12}$	$\frac{115}{12}$
22	$\frac{115}{12}$	$\frac{115}{12}$
23	$\frac{127}{12}$	$\frac{127}{12}$
24	$\frac{127}{12}$	$\frac{127}{12}$
25	$\frac{133}{12}$	$\frac{133}{12}$
26	$\frac{133}{12}$	$\frac{133}{12}$
27	$\frac{137}{12}$	$\frac{137}{12}$
28	$\frac{137}{12}$	$\frac{137}{12}$
29	$\frac{149}{12}$	$\frac{149}{12}$
30	$\frac{149}{12}$	$\frac{149}{12}$
31	$\frac{161}{12}$	$\frac{161}{12}$
32	$\frac{817}{60}$	$\frac{817}{60}$
33	$\frac{817}{60}$	$\frac{817}{60}$
34	$\frac{817}{60}$	$\frac{817}{60}$
35	$\frac{817}{60}$	$\frac{817}{60}$
36	$\frac{817}{60}$	$\frac{817}{60}$
37	$\frac{877}{60}$	$\frac{877}{60}$
38	$\frac{877}{60}$	$\frac{877}{60}$
39	$\frac{877}{60}$	$\frac{877}{60}$
40	$\frac{877}{60}$	$\frac{877}{60}$
41	$\frac{937}{60}$	$\frac{937}{60}$
42	$\frac{937}{60}$	$\frac{937}{60}$

	--	--
43	<u>997</u>	<u>997</u>
	60	60
44	<u>997</u>	<u>997</u>
	60	60
45	<u>997</u>	<u>997</u>
	60	60
46	<u>997</u>	<u>997</u>
	60	60
47	<u>1057</u>	<u>1057</u>
	60	60
48	<u>1057</u>	<u>1057</u>
	60	60
49	<u>1087</u>	<u>1087</u>
	60	60
50	<u>1087</u>	<u>1087</u>
	60	60
51	<u>1087</u>	<u>1087</u>
	60	60
52	<u>1087</u>	<u>1087</u>
	60	60
53	<u>1147</u>	<u>1147</u>
	60	60
54	<u>1147</u>	<u>1147</u>
	60	60
55	<u>1147</u>	<u>1147</u>
	60	60
56	<u>1147</u>	<u>1147</u>
	60	60
57	<u>1147</u>	<u>1147</u>
	60	60
58	<u>1147</u>	<u>1147</u>
	60	60
59	<u>1207</u>	<u>1207</u>
	60	60
60	<u>1207</u>	<u>1207</u>
	60	60
61	<u>1267</u>	<u>1267</u>
	60	60
62	<u>1267</u>	<u>1267</u>
	60	60
63	<u>1267</u>	<u>1267</u>
	60	60
64	<u>1277</u>	<u>1277</u>
	60	60
65	<u>1277</u>	<u>1277</u>
	60	60
66	<u>1277</u>	<u>1277</u>
	60	60
67	<u>1337</u>	<u>1337</u>
	60	60
68	<u>1337</u>	<u>1337</u>
	60	60
69	<u>1337</u>	<u>1337</u>
	60	60
70	<u>1337</u>	<u>1337</u>
	60	60
71	<u>1397</u>	<u>1397</u>
	60	60
72	<u>1397</u>	<u>1397</u>
	60	60
73	<u>1457</u>	<u>1457</u>
	60	60
74	<u>1457</u>	<u>1457</u>
	60	60
75	<u>1457</u>	<u>1457</u>
	60	60
76	<u>1457</u>	<u>1457</u>
	60	60
77	<u>1457</u>	<u>1457</u>
	60	60
78	<u>1457</u>	<u>1457</u>
	60	60
79	<u>1517</u>	<u>1517</u>
	60	60
80	<u>1517</u>	<u>1517</u>
	60	60
81	<u>383</u>	<u>383</u>
	15	15

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82	$\frac{383}{15}$	$\frac{383}{15}$
83	$\frac{398}{15}$	$\frac{398}{15}$
84	$\frac{398}{15}$	$\frac{398}{15}$
85	$\frac{398}{15}$	$\frac{398}{15}$
86	$\frac{398}{15}$	$\frac{398}{15}$
87	$\frac{398}{15}$	$\frac{398}{15}$
88	$\frac{398}{15}$	$\frac{398}{15}$
89	$\frac{413}{15}$	$\frac{413}{15}$
90	$\frac{413}{15}$	$\frac{413}{15}$
91	$\frac{413}{15}$	$\frac{413}{15}$
92	$\frac{413}{15}$	$\frac{413}{15}$
93	$\frac{413}{15}$	$\frac{413}{15}$
94	$\frac{413}{15}$	$\frac{413}{15}$
95	$\frac{413}{15}$	$\frac{413}{15}$
96	$\frac{413}{15}$	$\frac{413}{15}$
97	$\frac{428}{15}$	$\frac{428}{15}$
98	$\frac{428}{15}$	$\frac{428}{15}$
99	$\frac{428}{15}$	$\frac{428}{15}$
100	$\frac{428}{15}$	$\frac{428}{15}$

```

PrimeKappa[n_] := FullSimplify[MangoldtLambda[n] / Log[n]]
RiemannPrimeCounting[n_] := Sum[PrimeKappa[j], {j, 2, n}]
PI[n_, k_] := Sum[1 / k - PI[Floor[n / j], k + 1], {j, 2, n}]
Table[{n, PI[n, 1], RiemannPrimeCounting[n]}, {n, 1, 100}] // TableForm

```

1	0	0
2	1	1
3	2	2
4	$\frac{5}{2}$	$\frac{5}{2}$
5	$\frac{7}{2}$	$\frac{7}{2}$
6	$\frac{7}{2}$	$\frac{7}{2}$
7	$\frac{9}{2}$	$\frac{9}{2}$
8	$\frac{29}{6}$	$\frac{29}{6}$
9	$\frac{16}{3}$	$\frac{16}{3}$
10	$\frac{16}{3}$	$\frac{16}{3}$
11	$\frac{19}{3}$	$\frac{19}{3}$
12	$\frac{19}{3}$	$\frac{19}{3}$
13	$\frac{22}{3}$	$\frac{22}{3}$
14	$\frac{22}{3}$	$\frac{22}{3}$
15	$\frac{22}{3}$	$\frac{22}{3}$
16	$\frac{91}{12}$	$\frac{91}{12}$

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17	<u>103</u>	<u>103</u>
	12	12
18	<u>103</u>	<u>103</u>
	12	12
19	<u>115</u>	<u>115</u>
	12	12
20	<u>115</u>	<u>115</u>
	12	12
21	<u>115</u>	<u>115</u>
	12	12
22	<u>115</u>	<u>115</u>
	12	12
23	<u>127</u>	<u>127</u>
	12	12
24	<u>127</u>	<u>127</u>
	12	12
25	<u>133</u>	<u>133</u>
	12	12
26	<u>133</u>	<u>133</u>
	12	12
27	<u>137</u>	<u>137</u>
	12	12
28	<u>137</u>	<u>137</u>
	12	12
29	<u>149</u>	<u>149</u>
	12	12
30	<u>149</u>	<u>149</u>
	12	12
31	<u>161</u>	<u>161</u>
	12	12
32	<u>817</u>	<u>817</u>
	60	60
33	<u>817</u>	<u>817</u>
	60	60
34	<u>817</u>	<u>817</u>
	60	60
35	<u>817</u>	<u>817</u>
	60	60
36	<u>817</u>	<u>817</u>
	60	60
37	<u>877</u>	<u>877</u>
	60	60
38	<u>877</u>	<u>877</u>
	60	60
39	<u>877</u>	<u>877</u>
	60	60
40	<u>877</u>	<u>877</u>
	60	60
41	<u>937</u>	<u>937</u>
	60	60
42	<u>937</u>	<u>937</u>
	60	60
43	<u>997</u>	<u>997</u>
	60	60
44	<u>997</u>	<u>997</u>
	60	60
45	<u>997</u>	<u>997</u>
	60	60
46	<u>997</u>	<u>997</u>
	60	60
47	<u>1057</u>	<u>1057</u>
	60	60
48	<u>1057</u>	<u>1057</u>
	60	60
49	<u>1087</u>	<u>1087</u>
	60	60
50	<u>1087</u>	<u>1087</u>
	60	60
51	<u>1087</u>	<u>1087</u>
	60	60
52	<u>1087</u>	<u>1087</u>
	60	60
53	<u>1147</u>	<u>1147</u>
	60	60
54	<u>1147</u>	<u>1147</u>
	60	60
55	<u>1147</u>	<u>1147</u>
	60	60



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56	<u>1147</u>	<u>1147</u>
	60	60
57	<u>1147</u>	<u>1147</u>
	60	60
58	<u>1147</u>	<u>1147</u>
	60	60
59	<u>1207</u>	<u>1207</u>
	60	60
60	<u>1207</u>	<u>1207</u>
	60	60
61	<u>1267</u>	<u>1267</u>
	60	60
62	<u>1267</u>	<u>1267</u>
	60	60
63	<u>1267</u>	<u>1267</u>
	60	60
64	<u>1277</u>	<u>1277</u>
	60	60
65	<u>1277</u>	<u>1277</u>
	60	60
66	<u>1277</u>	<u>1277</u>
	60	60
67	<u>1337</u>	<u>1337</u>
	60	60
68	<u>1337</u>	<u>1337</u>
	60	60
69	<u>1337</u>	<u>1337</u>
	60	60
70	<u>1337</u>	<u>1337</u>
	60	60
71	<u>1397</u>	<u>1397</u>
	60	60
72	<u>1397</u>	<u>1397</u>
	60	60
73	<u>1457</u>	<u>1457</u>
	60	60
74	<u>1457</u>	<u>1457</u>
	60	60
75	<u>1457</u>	<u>1457</u>
	60	60
76	<u>1457</u>	<u>1457</u>
	60	60
77	<u>1457</u>	<u>1457</u>
	60	60
78	<u>1457</u>	<u>1457</u>
	60	60
79	<u>1517</u>	<u>1517</u>
	60	60
80	<u>1517</u>	<u>1517</u>
	60	60
81	<u>383</u>	<u>383</u>
	15	15
82	<u>383</u>	<u>383</u>
	15	15
83	<u>398</u>	<u>398</u>
	15	15
84	<u>398</u>	<u>398</u>
	15	15
85	<u>398</u>	<u>398</u>
	15	15
86	<u>398</u>	<u>398</u>
	15	15
87	<u>398</u>	<u>398</u>
	15	15
88	<u>398</u>	<u>398</u>
	15	15
89	<u>413</u>	<u>413</u>
	15	15
90	<u>413</u>	<u>413</u>
	15	15
91	<u>413</u>	<u>413</u>
	15	15
92	<u>413</u>	<u>413</u>
	15	15
93	<u>413</u>	<u>413</u>
	15	15
94	<u>413</u>	<u>413</u>
	15	15

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	<u>413</u>	<u>413</u>
95	15	15
	<u>413</u>	<u>413</u>
96	15	15
	<u>428</u>	<u>428</u>
97	15	15
	<u>428</u>	<u>428</u>
98	15	15
	<u>428</u>	<u>428</u>
99	15	15
	<u>428</u>	<u>428</u>
100	15	15