```
e2[n_, k_] := e2[n, k] = Sum[e2[j, k - 1] e2[n / j, 1], {j, Divisors[n]}];
e2[n_, 1] := If[Mod[n, 3] == 0, -1, 1]; e2[1, 1] := 0; e2[n_, 0] := 0; e2[1, 0] := 1
E2[n_, k_] := E2[n, k] = Sum[ e2[j, k], {j, 2, n}]
l2[n_] := l2[n] = Sum[(-1)^(k + 1) / k e2[n, k], {k, 1, Log[2, n]}]
L2[n_] := L2[n] = Sum[(-1)^(k + 1) / k E2[n, k], {k, 1, Log[2, n]}]
LL2[n_] := Sum[(-1)^(k + 1) / k E2[n, k], {k, 1, Log[2, n]}]
```

```
e2[12, 3]
```

```
-3
```

```
Table[{n, l2[n]}, {n, 2, 100}] // TableForm
```

2	1
3	-1
4	$\frac{1}{2}$
5	1
6	0
7	1
8	$\frac{1}{3}$
9	$-\frac{3}{2}$
10	0
11	1
12	0
13	1
14	0
15	0
16	$\frac{1}{4}$
17	1
18	0
19	1
20	0
21	0
22	0
23	1
24	0
25	$\frac{1}{2}$
26	0
27	$-\frac{7}{3}$
28	0
29	1
30	0
31	1
32	$\frac{1}{5}$
33	0
34	0
35	0
36	0
37	1
38	0
39	0
40	0
41	1
42	0

43	1
44	0
45	0
46	0
47	1
48	0
49	$\frac{1}{2}$
50	0
51	0
52	0
53	1
54	0
55	0
56	0
57	0
58	0
59	1
60	0
61	1
62	0
63	0
64	$\frac{1}{6}$
65	0
66	0
67	1
68	0
69	0
70	0
71	1
72	0
73	1
74	0
75	0
76	0
77	0
78	0
79	1
80	0
81	$-\frac{15}{4}$
82	0
83	1
84	0
85	0
86	0
87	0
88	0
89	1
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	1

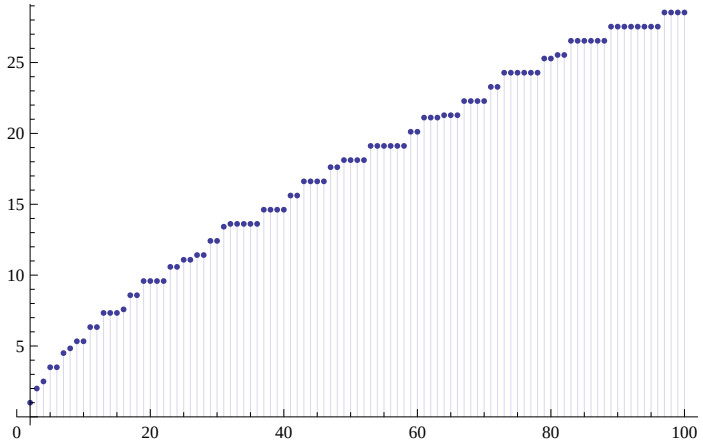
```
98    0
99    0
100   0
```

```
L2[100]
```

$$\frac{268}{15}$$

```
LAdd3[n_] := Sum[ 2^k / k, {k, 1, Log[3, n]}]
```

```
DiscretePlot[ LL2[n] + LAdd3[n], {n, 2, 100}]
```




```
P2[100, 1]
```

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

```
E2[100, 2]
```

```
3
```

```
Sum[ (-1)^( k - j), {j, 2, 100}, {k, 2, Floor[100 / j]}]
```

```
3
```

```
Expand[E2[n, 1]]
```

$$-\frac{1}{2} - \frac{(-1)^n}{2}$$

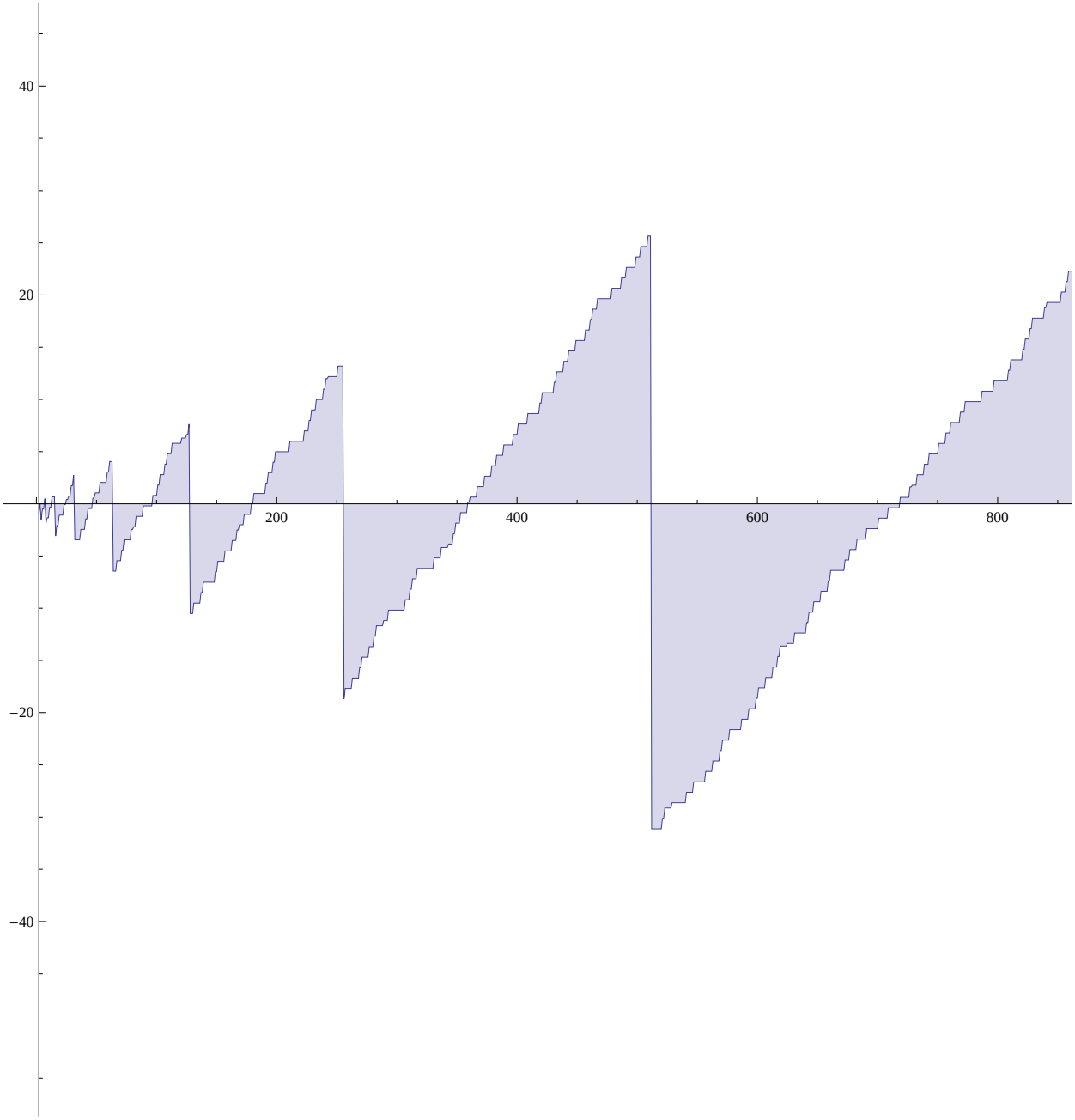
```
E2[x, 2]
```

```
0
```

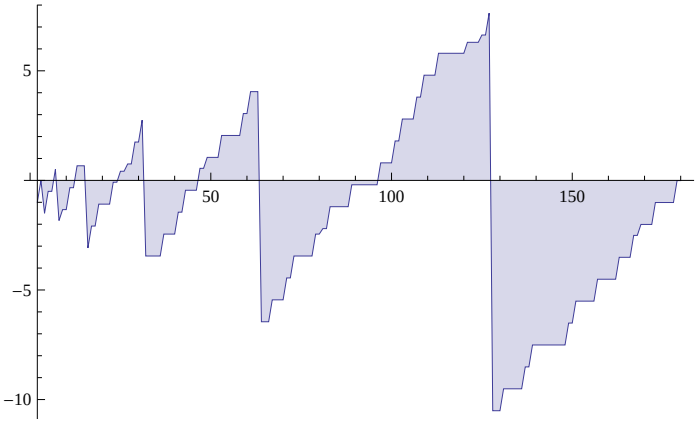
```
E2[14, 2]
```

```
-2
```

```
P2[n_, k_] := P2[n, k] = Sum[ (-1)^(j + 1) ( 1 / k - P2[Floor[n / j], k + 1]), {j, 2, n}]
DiscretePlot[ P2[n, 1], {n, 2, 90 * 16}]
```



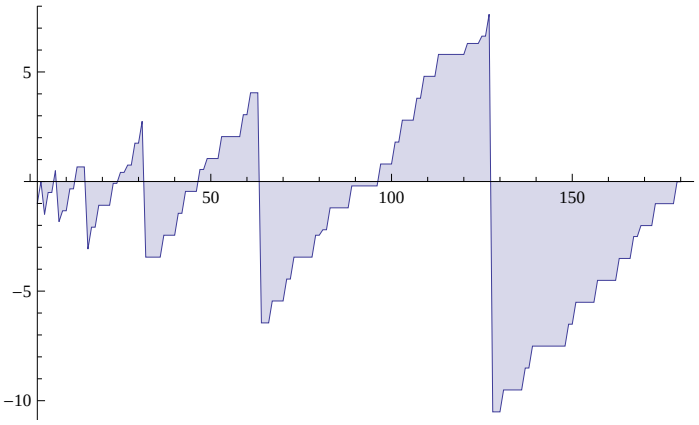
```
P2a[n_, k_] :=
 Sum[(-1)^(j + 1) (1 / k), {j, 2, n}] + Sum[(-1)^(j + 1) (- P2a[n / j, k + 1]), {j, 2, n}]
DiscretePlot[P2a[n, 1], {n, 2, 90 * 2}]
```




```
Expand[Sum[(-1)^(j + 1) (1 / k), {j, 2, n}]]
```

$$-\frac{1}{2\,k}-\frac{(-1)^n}{2\,k}$$

```
P2a[n_, k_] :=
 Sum[(-1)^(j + 1), {j, 2, n}] / k + Sum[(-1)^(j + 1) (- P2a[n / j, k + 1]), {j, 2, n}]
DiscretePlot[P2a[n, 1], {n, 2, 90 * 2}]
```

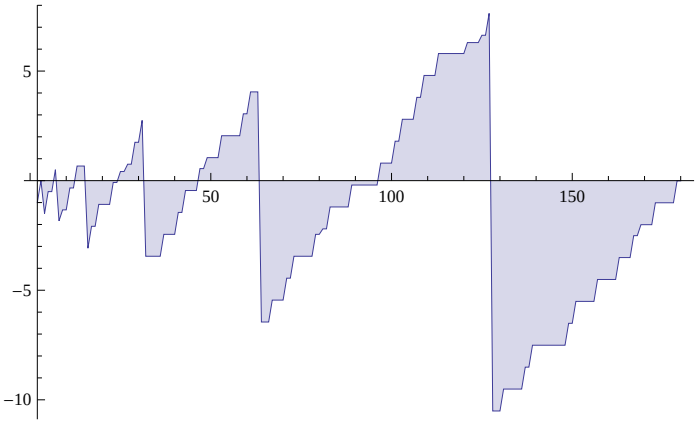



```
Sum[(-1)^(j + 1), {j, 2, n}]
```

$$\frac{1}{2}\,(-1-(-1)^n)$$

```
P2a[n_, k_] := -((1/2) (1 + (-1)^n)) / k + Sum[ (-1)^j ( P2a[Floor[n / j], k + 1]), {j, 2, n}]
```

```
DiscretePlot[ P2a[n, 1], {n, 2, 90 * 2}]
```




```
Mod[101, 3]
```

2