

```

Dh[n_, k_, a_] :=
  Dh[n, k, a] = Sum[Binomial[k, j] Dh[n / (m^(k - j)), j, m + 1], {m, a, n^(1 / k)}, {j, 0, k - 1}]
Dh[n_, 1, a_] := Floor[n] - a + 1; Dh[n_, 0, a_] := 1
lin[n_] := Sum[(-1)^(k + 1) / k Dh[n, k, 2], {k, 1, Log[2, n]}]

```

```

dif[n_, k_, a_] := (2^a)^-k Dh[n (2^a)^k, k, 1 + (2^a)] -
  (2^(a - 1))^-k Dh[n (2^(a - 1))^k, k, 1 + (2^(a - 1))]

```

```

dif2[n_, k_, a_] :=
  (a)^-k Dh[n (a)^k, k, 1 + (a)] - ((a - 1))^-k Dh[n ((a - 1))^k, k, 1 + ((a - 1))]

```

```

ldif[n_, a_, t_] := Sum[(-1)^(k + 1) / k dif[n, k, a], {k, 1, t}]
ldif2[n_, a_, t_] := Sum[(-1)^(k + 1) / k dif2[n, k, a], {k, 1, t}]

```

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ldif[100, 1, 12]
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505 039
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7 096 320

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Table[{n, dif2[n, aa = 3, bb = 4] - dif2[n - 1, aa, bb]}, {n, 1, 100}] // TableForm
```

1	0
2	$\frac{1}{64}$
3	$-\frac{13}{1728}$
4	$\frac{31}{144}$
5	$\frac{221}{1728}$
6	$-\frac{17}{576}$
7	$\frac{25}{72}$
8	$\frac{251}{1728}$
9	$\frac{43}{288}$
10	$\frac{97}{288}$
11	$\frac{49}{192}$
12	$-\frac{83}{576}$
13	$\frac{863}{1728}$
14	$\frac{89}{288}$
15	$\frac{59}{288}$
16	$\frac{1}{48}$
17	$\frac{347}{576}$
18	$-\frac{5}{288}$
19	$\frac{113}{432}$
20	$\frac{35}{192}$
21	$\frac{37}{48}$
22	$\frac{179}{288}$
23	$\frac{115}{288}$
24	$-\frac{65}{96}$
25	$\frac{281}{576}$

26	$\frac{11}{48}$
27	$\frac{293}{1728}$
28	$\frac{277}{576}$
29	$\frac{433}{576}$
30	$\frac{67}{192}$
31	$\frac{773}{576}$
32	$-\frac{793}{576}$
33	$\frac{395}{192}$
34	$-\frac{5}{18}$
35	$-\frac{7}{64}$
36	$\frac{161}{576}$
37	$\frac{635}{576}$
38	$-\frac{593}{864}$
39	$\frac{79}{96}$
40	$-\frac{455}{576}$
41	$\frac{215}{288}$
42	$\frac{613}{576}$
43	$-\frac{163}{576}$
44	$\frac{947}{576}$
45	$\frac{691}{576}$
46	$-\frac{149}{576}$
47	$-\frac{425}{576}$
48	$-\frac{47}{288}$
49	$\frac{499}{576}$
50	$\frac{439}{864}$
51	$\frac{283}{288}$
52	$-\frac{155}{144}$
53	$\frac{1529}{576}$
54	$-\frac{241}{192}$
55	$\frac{79}{64}$
56	$-\frac{77}{72}$
57	$\frac{671}{288}$
58	$-\frac{23}{576}$
59	$\frac{1}{9}$
60	$\frac{1}{36}$
61	$\frac{67}{36}$
62	$\frac{97}{72}$
63	$-\frac{65}{72}$
64	$-\frac{2137}{1728}$

65	$\frac{581}{192}$
66	$\frac{65}{288}$
67	$-\frac{1223}{576}$
68	$\frac{1279}{576}$
69	$\frac{205}{288}$
70	$-\frac{143}{96}$
71	$\frac{959}{288}$
72	$-\frac{59}{36}$
73	$\frac{455}{576}$
74	$\frac{191}{144}$
75	$-\frac{11}{32}$
76	$-\frac{109}{288}$
77	$\frac{637}{192}$
78	$-\frac{1555}{576}$
79	$\frac{721}{288}$
80	$-\frac{467}{144}$
81	$\frac{373}{144}$
82	$-\frac{1609}{1728}$
83	$\frac{637}{288}$
84	$-\frac{7}{96}$
85	$\frac{211}{96}$
86	$-\frac{115}{64}$
87	$\frac{1559}{576}$
88	$-\frac{121}{576}$
89	$-\frac{107}{32}$
90	$\frac{1109}{192}$
91	$-\frac{169}{192}$
92	$\frac{191}{576}$
93	$\frac{443}{144}$
94	$-\frac{1595}{576}$
95	$\frac{191}{192}$
96	$-\frac{299}{192}$
97	$\frac{1205}{576}$
98	$-\frac{193}{288}$
99	$\frac{2093}{576}$
100	$-\frac{439}{144}$

