

```

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
E2D2[n_, k_, b_] :=
  (-1)^k + Sum[b^a / ((k - 1)!) Binomial[k, j] Pochhammer[a - k + j + 1, k - 1] E2a[b^-a n, j, b],
    {a, 0, Log[b, n]}, {j, 0, k}]
D2a[n_, k_] := D2a[n, k] = Sum[D2a[Floor[n / j], k - 1], {j, 2, n}]; D2a[n_, 0] := 1
D2E2[n_, k_, b_] :=
  Sum[ (-1)^j b^j Binomial[k, j] Sum[ Binomial[j, m] D2a[n / b^j, k - m], {m, 0, j}], {j, 0, k}]
D2E2a[n_, k_, b_] :=
  Sum[ (-1)^j b^j Binomial[k, j] Binomial[j, m] D2a[n / b^j, k - m], {j, 0, k}, {m, 0, j}]
D2E2b[n_, k_, c_] :=
  Sum[ c^j Binomial[j - k - 1, j] Binomial[j, m] D2a[n / c^j, k - m], {j, 0, k}, {m, 0, j}]
D2E2c[n_, k_, c_] :=
  Sum[ c^j Binomial[j - k - 1, j] Binomial[j, m] D2a[n / c^j, k - m], {j, 0, k}, {m, 0, j}]
D2E2a2[n_, k_, b_] := Grid[Table[
  (-1)^j b^j Binomial[k, j] Binomial[j, m] D22[Floor[n / b^j], k - m], {j, 0, k}, {m, 0, j}]]
D2E2a1[n_, k_, b_] := Grid[Table[ (-1)^j b^j Binomial[k, j]
  Binomial[j, m] D2a[Floor[n / b^j], k - m], {j, 0, k}, {m, 0, j}]]
d2[n_, k_] := D2a[n, k] - D2a[n - 1, k]

E2a[200, 2, 3]

9

D2a[100, 2]

283

E2D2[100, 2, 2]

283

D2E2a2[200, 2, 1.00001]

1. D22[200., 2]
-2.00002 D22[199.998, 2] -2.00002 D22[199.998, 1]
1.00002 D22[199.996, 2] 2.00004 D22[199.996, 1] 1.00002 D22[199.996, 0]

```

D2E2a2[108, 5, c]

$$\begin{aligned}
 & D22[108, 5] \\
 & -5c \quad -5c \\
 & D22\left[\text{Floor}\left[\frac{108}{c}\right], 5\right] \quad D22\left[\text{Floor}\left[\frac{108}{c}\right], 4\right] \\
 & 10c^2 \quad 20c^2 \quad 10c^2 \\
 & D22\left[\text{Floor}\left[\frac{108}{c^2}\right], 5\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^2}\right], 4\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^2}\right], 3\right] \\
 & -10c^3 \quad -30c^3 \quad -30c^3 \quad -10c^3 \\
 & D22\left[\text{Floor}\left[\frac{108}{c^3}\right], 5\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^3}\right], 4\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^3}\right], 3\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^3}\right], 2\right] \\
 & 5c^4 D22\left[\text{Floor}\left[\frac{108}{c^4}\right], 5\right] \quad 20c^4 \quad 30c^4 \quad 20c^4 \quad 5c^4 D22\left[\text{Floor}\left[\frac{108}{c^4}\right], 1\right] \\
 & \quad \quad D22\left[\text{Floor}\left[\frac{108}{c^4}\right], 4\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^4}\right], 3\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^4}\right], 2\right] \\
 & -c^5 D22\left[\text{Floor}\left[\frac{108}{c^5}\right], 5\right] \quad -5c^5 \quad -10c^5 \quad -10c^5 \quad -5c^5 \quad -c^5 D22\left[\text{Floor}\left[\frac{108}{c^5}\right], 0\right] \\
 & \quad \quad D22\left[\text{Floor}\left[\frac{108}{c^5}\right], 4\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^5}\right], 3\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^5}\right], 2\right] \quad D22\left[\text{Floor}\left[\frac{108}{c^5}\right], 1\right]
 \end{aligned}$$

D2E2a1[108, 10, 1.000000001]

0.
 0. 0.
 0. 0. 0.
 0. 0. 0. 0.
 0. 0. 0. 0. 1470.
 0. 0. 0. 0. -8820. -12852.
 0. 0. 0. 0. 22050. 64260. 39480.
 0. 0. 0. 0. -29400. -128520. -157920. -41400.
 0. 0. 0. 0. 22050. 128520. 236880. 124200. 13635.
 0. 0. 0. 0. -8820. -64260. -157920. -124200. -27270. -1060.
 0. 0. 0. 0. 1470. 12852. 39480. 41400. 13635. 1060. 1.

D2E2a[108, 3, 1.000000001]

26.

d2[107, 3] - 1

-1