```
ClearAll["Global`*"]
```

ClearAll::clloc : Cannot clear local variable j. ≫

```
E2[n_, k_, b_] :=
 E2[n, k, b] = Sum[ E2[n / j, k - 1, b], {j, 2, n}] - b Sum[ E2[n / (b j), k - 1, b], {j, 1, n / b}];
E2[n_, 0, a_] := 1
D1[n_, k_, b_] := Sum[ Binomial[k + j - 1, k - 1] b^j
    Sum[FactorialPower[k, a] / a! E2[n / b^j, a, b], {a, 0, Log[If[b > 2, 2, b], n / b^j]}],
  {j, 0, Log[b, n]}]
M2[n_, b_] := Sum[(-1)^k ( E2[n, k, b] - b E2[n / b, k, b]), {k, 0, Log[b, n]}]
P[n_, b_] := Sum[ ((-1)^(k + 1) E2[n, k, b] + b^k) / k, {k, 1, Log[b, n]}]


EL2[n_, k_, b_] :=
 Sum[ EL2[n / j, k - 1, b], {j, 2, n}] - b Sum[ EL2[n / (j b), k - 1, b], {j, 1, n / b}]
EL2[n_, 1, b_] := Sum[ Log[j], {j, 2, n}] - b Sum[ Log[j b], {j, 1, n / b}]
cheb[n_, b_] := Sum[ (-1)^(k + 1) EL2[n, k, b] + Log[b] b^k, {k, 1, Log[b, n]}]


N[{M2[100, 2], P[100, 2], cheb[100, 2]}]
```

{1., 28.5333, 94.0453}

```
et[n_, b_, a_] :=
 Binomial[a, 4] b^(a - 4) Sum[1, {j, 2, n}, {k, 2, n / j}, {l, 2, n / (j k)}, {m, 2, n / (j k l)}] -
  Binomial[a, 3] b^(a - 3)
   Sum[1, {j, 2, n}, {k, 2, n / j}, {l, 2, n / (j k)}, {m, 1, n / (j k l b)}] + Binomial[a, 2]
    b^(a - 2) Sum[1, {j, 2, n}, {k, 2, n / j}, {l, 1, n / (j k b)}, {m, 1, n / (j k l b^2)}] -
  Binomial[a, 1] b^(a - 1) Sum[1, {j, 2, n}, {k, 1, n / (b j)},
    {l, 1, n / (j k b^2)}, {m, 1, n / (j k l b^3)}] + Binomial[a, 0] b^a
   Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {l, 1, n / (j k b^3)}, {m, 1, n / (j k l b^4)}]
et[30, 3 / 2, 4]
```

$$-\frac{481}{16}$$

```
E2[30, 4, 3 / 2]
```

$$-\frac{481}{16}$$

```
es[n_, b_, a_] := Binomial[a, 2] b^(a - 2) Sum[1, {j, 2, n}, {k, 2, n / j}] -
   Binomial[a, 1] b^(a - 1) Sum[1, {j, 2, n}, {k, 1, n / (b j)}] +
   Binomial[a, 0] b^a Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]]
es3[n_, b_, a_] := -3 b^1 Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}] +
   3 b^2 Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}] -
   1 b^3 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}]
es4[n_, b_, a_] := 6 b^2 Sum[1, {j, 2, n}, {k, 2, n / j},
      {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}] -
   4 b^3 Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)}] +
   1 b^4 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}]
es5[n_, b_, a_] := -10 b^3 Sum[1, {j, 2, n}, {k, 2, n / j},
      {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}, {s, 1, n / (j k m l b^3)}] +
   5 b^4 Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)},
      {s, 1, n / (l j k m b^4)}] - 1 b^5 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)},
      {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}, {s, 1, n / (j k m l b^5)}]


esa[n_, b_, a_] := {Binomial[a, 2] b^(a - 2) Sum[1, {j, 2, n}, {k, 2, n / j}],
   -Binomial[a, 1] b^(a - 1) Sum[1, {j, 2, n}, {k, 1, n / (b j)}],
   + Binomial[a, 0] b^a Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]}
es3a[n_, b_] := {-3 b^1 Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}],
   3 b^2 Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}],
   - 1 b^3 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}]}
es4a[n_, b_] := {6 b^2 Sum[1, {j, 2, n}, {k, 2, n / j},
      {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}], -4 b^3
    Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)}], 1 b^4
    Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}]}
es5a[n_, b_, a_] := {-10 b^3 Sum[1, {j, 2, n}, {k, 2, n / j},
      {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}, {s, 1, n / (j k m l b^3)}],
   5 b^4 Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)},
      {s, 1, n / (l j k m b^4)}], - 1 b^5 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)},
      {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}, {s, 1, n / (j k m l b^5)}]}


es2a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}], Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]}
es3a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}],
   Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}]}
es4a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)}],
   Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}]}
es5a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)},
      {s, 1, n / (j k m l b^3)}], Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)},
      {l, 1, n / (j k m b^3)}, {s, 1, n / (l j k m b^4)}], Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)},
      {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}, {s, 1, n / (j k m l b^5)}]}


es[10, 3 / 2, 2]

2

E2[10, 2, 3 / 2]

2
```

es3[6, 3 / 2, 3]

$-\dfrac{9}{8}$

E2[6, 3, 3 / 2]

$-\dfrac{9}{8}$

es4[6, 3 / 2, 4]

$\dfrac{81}{16}$

E2[6, 4, 3 / 2]

$\dfrac{81}{16}$

N[es2a2[6, 1.1, 2]]

es2a2[6.`, 1.0000001]

{3, 5, 10}

N[es3a2[6, 1.000001]]

{1., 6., 16.}

N[es4a2[6, 1.000001]]

{1., 7., 23.}

es5a2[6, 1.000001, 2]

{1, 8, 31}

Binomial[p, 0]

1

```
es5a[n_, b_, a_] :=
 {-10 b^3 Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)},
     {s, 1, n / (j k m l b^3)}], 5 b^4 Sum[1, {j, 2, n}, {k, 1, n / (b j)},
     {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)}, {s, 1, n / (l j k m b^4)}],
   - 1 b^5 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)},
     {l, 1, n / (j k m b^4)}, {s, 1, n / (j k m l b^5)}]}

es2a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}], Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]}
es3a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}],
   Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}]}
es4a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)}],
   Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}, {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}]}
es5a2[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j}, {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)},
     {s, 1, n / (j k m l b^3)}], Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)},
     {l, 1, n / (j k m b^3)}, {s, 1, n / (l j k m b^4)}], Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)},
     {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}, {s, 1, n / (j k m l b^5)}]}

ff[n_, k_, b_, r_] := Sum[ff[n / ( j b), k - 1, b, r], {j, 1, n}]; ff[n_, 0, b_, r_] := 1

es5a3[n_, b_] := {Sum[1, {j, 2, n}, {k, 2, n / j},
     {m, 1, n / (j k b)}, {l, 1, n / (j k m b^2)}, {s, 1, n / (j k m l b^3)}],
   Sum[1, {j, 2, n}, {k, 1, n / (b j)}, {m, 1, n / ( j k b^2)}, {l, 1, n / (j k m b^3)},
     {s, 1, n / (l j k m b^4)}], Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)},
     {m, 1, n / (j k b^3)}, {l, 1, n / (j k m b^4)}, {s, 1, n / (j k m l b^5)}]}

esp[n_, b_, p_] := {Sum[ ff[n / (j k), p, b, 1], {j, 2, n}, {k, 2, n / j}],
   Sum[ ff[n / j, p + 1, b, 1], {j, 2, n}], ff[n, p + 2, b, 1]}
esp2[n_, p_, b_] := (-1)^p
   (b^ (p - 2) Binomial[p, 2] Sum[ ff[n / (j k), p - 2, b, 1], {j, 2, n}, {k, 2, n / j}] - b^ (p - 1)
       Binomial[p, 1] Sum[ ff[n / j, p - 1, b, 1], {j, 2, n}] + b^p Binomial[p, 0] ff[n, p, b, 1])

esp3[n_, p_, b_] := (-1)^p
   (b^ (p - 2) Binomial[p, 2] - b^ (p - 1) Binomial[p, 1] Sum[ ff[n / j, p - 1, b, 1], {j, 2, n}] +
     b^p Binomial[p, 0] ff[n, p, b, 1])
esp3a[n_, p_, b_] := {b^ (p - 2) Binomial[p, 2], -b^ (p - 1) Binomial[p, 1]
     Sum[ ff[n / j, p - 1, b, 1], {j, 2, n}], b^p Binomial[p, 0] ff[n, p, b, 1]}
esp3b[n_, p_, b_] := {b^ (p - 2) ((p - 1) (p) / 2),
   -b^ (p - 1) ((p + 1) (p + 2) - 2), b^p ((p + 4) (p + 3) / 2 - 5)}
esp3ab[n_, p_, b_] := {-b^ (p - 1) Binomial[p, 1] Sum[ ff[n / j, p - 1, b, 1], {j, 2, n}],
   b^p Binomial[p, 0] ff[n, p, b, 1], -b^ (p - 1) ((p + 1) (p + 2) - 2), b^p ((p + 4) (p + 3) / 2 - 5)}
esp3a2[n_, p_, b_] := {b^ (p - 2) ((p) (p - 1) / 2),
   -b^ (p - 1) p Sum[ ff[n / j, p - 1, b, 1], {j, 2, n}], b^p ff[n, p, b, 1]}
esp3c[n_, p_, b_] := (-1)^ (p)
   (b^ (p - 2) ((p - 1) (p) / 2) - b^ (p - 1) ((p + 1) (p + 2) - 2) + b^p ((p + 4) (p + 3) / 2 - 5))

Table[esp3a2[6, n, 1.01], {n, 1, 30}] // TableForm
```

```
0.          -5.          6.06
1.          -16.16       10.201
3.03        -18.3618     16.4848
6.1206      -28.8484     23.9339
10.303      -41.6242     32.5813
15.6091     -56.7545     42.4608
22.0712     -74.3064     53.6068
29.7226     -94.3479     66.0543
38.5969     -116.949     79.839
48.7286     -142.179     94.9975
60.1527     -170.112     111.567
72.9051     -200.82      129.585
87.0221     -234.38      149.09
102.541     -270.866     170.122
119.5       -310.358     192.721
137.937     -352.935     216.927
157.892     -398.677     242.782
179.405     -447.667     270.329
202.516     -499.99      299.611
227.268     -555.73      306.268
253.703     -589.352     337.675
281.864     -650.703     370.925
311.795     -715.712     406.064
343.542     -784.47      443.137
377.149     -857.071     482.194
412.664     -933.61      523.284
450.134     -1014.19     566.454
489.607     -1098.9      611.758
531.133     -1187.84     659.245
574.762     -1281.12     708.969
```

esp3a[6, 5, 1.00001]

{10.0003, -40.0016, 31.0016, 40, 31}

esp3b[6, 5, 1.00001]

{10.0003, -40.0016, 31.0016}

Binomial[5, 2]

10

Binomial[p, 2]

$$\frac{1}{2}(-1+p)\,p$$

es5a3[6, 1.000001]

{1, 8, 31}

esp[6, 1.000001, 3]

{1, 8, 31}

N[es4a2[6, 1.000001]]

{1., 7., 23.}

```
FullSimplify[
 Expand[b^(p-2) ((p-1) (p) / 2) - b^(p-1) ((p+1) (p+2) - 2) + b^p ((p+4) (p+3) / 2 - 5)]]
```

$$\frac{1}{2} \, b^{-2+p} \left((-1+p)\, p - 2\, b\, p\, (3+p) + b^2 \, (2+p\,(7+p)) \right)$$

```
esp3c[n_, p_, b_] :=
 (-1)^(p) (b^(p-2) ((p-1) (p) / 2) - b^(p-1) ((p+1) (p+2) - 2) + b^p ((p+4) (p+3) / 2 - 5))
esp3d[n_, p_, b_] :=
 (-1)^(p) (b^(p-2) ((p-1) (p) / 2) - b^(p-1) ((p+1) (p+2) - 2) + b^p ((p+4) (p+3) / 2 - 5))
```

```
Table[ {1.01^n, esp3[6, n, 1.01], esp3c[6, n, aa = 1.01],
    esp3d[6, n, aa = 1.01], E2[6, n, aa]}, {n, 3, 30}] // TableForm
```

1.0303	−1.15302	−1.15302	−1.15302	−1.15302
1.0406	1.20606	1.20606	1.20606	1.20606
1.05101	−1.26016	−1.26016	−1.26016	−1.26016
1.06152	1.31532	1.31532	1.31532	1.31532
1.07214	−1.37157	−1.37157	−1.37157	−1.37157
1.08286	1.42891	1.42891	1.42891	1.42891
1.09369	−1.48737	−1.48737	−1.48737	−1.48737
1.10462	1.54697	1.54697	1.54697	1.54697
1.11567	−1.60772	−1.60772	−1.60772	−1.60772
1.12683	1.66964	1.66964	1.66964	1.66964
1.13809	−1.73274	−1.73274	−1.73274	−1.73274
1.14947	1.79706	1.79706	1.79706	1.79706
1.16097	−1.8626	−1.8626	−1.8626	−1.8626
1.17258	1.92939	1.92939	1.92939	1.92939
1.1843	−1.99745	−1.99745	−1.99745	−1.99745
1.19615	2.06679	2.06679	2.06679	2.06679
1.20811	−2.13743	−2.13743	−2.13743	20.8166
1.22019	−22.1944	2.2094	2.2094	1.96778
1.23239	−2.02648	−2.28272	−2.28272	−2.02648
1.24472	2.08628	2.35741	2.35741	2.08628
1.25716	−2.1472	−2.43348	−2.43348	−2.1472
1.26973	2.20925	2.51097	2.51097	2.20925
1.28243	−2.27245	−2.58988	−2.58988	−2.27245
1.29526	2.33682	2.67025	2.67025	2.33682
1.30821	−2.40238	−2.7521	−2.7521	−2.40238
1.32129	2.46915	2.83545	2.83545	2.46915
1.3345	−2.53714	−2.92031	−2.92031	−2.53714
1.34785	2.60638	3.00673	3.00673	2.60638

−1.00003

```
Table[ {esp3[6, n, 1.00001], (esp2[6, n, 1.00001]), E2[6, n, 1.00001]}, {n, 1, 10}] //
 TableForm
```

$RecursionLimit::reclim : Recursion depth of 10000 exceeded. ≫

$RecursionLimit::reclim : Recursion depth of 10000 exceeded. ≫

```
-1.00006     -1.00006     -0.00005
-4.99996     -2.99996     3.0001
-1.00015     -7.00021     -1.00015
1.0002       1.0002       1.0002
-1.00025     -1.00025     -1.00025
1.0003       1.0003       1.0003
-1.00035     -1.00035     -1.00035
1.0004       1.0004       1.0004
-1.00045     -1.00045     -1.00045
1.0005       1.0005       1.0005
```

```
E2[6, 13, 1.000001]
```
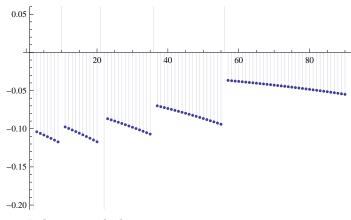
-1.00007

```
esp3[6, 13, 1.000001]
```

-1.00007

```
$RecursionLimit = 10 000
```

10 000

```
DiscretePlot[ ((-1) ^ (k + 1) E2[n, k, b] + 1) / k, {k, 1, Log[b, n]}] /. {b → 1.02, n → 6}
```

DiscretePlot::iterb : Iterator {k, 1, Log[b, n]} does not have appropriate bounds. ≫


```
esp3c[n_, p_, b_] :=
 (-1) ^ (p) (b ^ (p - 2) ((p - 1) (p) / 2) - b ^ (p - 1) ((p + 1) (p + 2) - 2) + b^p ((p + 4) (p + 3) / 2 - 5))
```

```
Sum[ ((-1) ^ (n - 1) esp3c[6, n, 1.00001] + 1) / n, {n, 1, Log[1.00001, 1.2]}]
```

-1.00036

```
FullSimplify[Sum[ ((-1) ^ (n - 1) esp3c[6, n, b] + 1) / n, {n, 1, Log[b, 6 / 5]}]]
```

$$\frac{1}{10}\left(-7 + 10\,\text{HarmonicNumber}\left[\frac{\text{Log}\left[\frac{6}{5}\right]}{\text{Log}[b]}\right] + \right.$$

$$\left. 12\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right] + 10\,\text{Log}[1-b] - \frac{6\,(-1+b)\,\text{Log}\left[\frac{6}{5}\right]}{b\,\text{Log}[b]}\right)$$

```
Limit[
```
$$\frac{1}{10}\left(-7 + 10\,\text{HarmonicNumber}\left[\frac{\text{Log}\left[\frac{6}{5}\right]}{\text{Log}[b]}\right] + 10\,\text{Log}[1-b] - \frac{6\,(-1+b)\,\text{Log}\left[\frac{6}{5}\right]}{b\,\text{Log}[b]}\right), b \to 1]$$

$$-\frac{7}{10} + \text{EulerGamma} + i\,\pi - \frac{3}{5}\,\text{Log}\left[\frac{6}{5}\right] + \text{Log}\left[\text{Log}\left[\frac{6}{5}\right]\right] + \text{Limit}\left[\frac{6}{5}\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right], b \to 1\right]$$

$$-\frac{7}{10} + \text{EulerGamma} + i\,\pi + \text{Limit}\left[\frac{6}{5}\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right], b \to 1\right] - \frac{3}{5}\,\text{Log}\left[\frac{6}{5}\right] + \text{Log}\left[\text{Log}\left[\frac{6}{5}\right]\right]$$

```
Limit[
```
$$\frac{1}{10}\left(12\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right]\right), b \to 1]$$

$$\text{Limit}\left[\frac{6}{5}\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right], b \to 1\right]$$

```
fe[b_] :=
```
$$-\frac{7}{10} + \text{EulerGamma} + i\,\pi + \frac{6}{5}\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right] - \frac{3}{5}\,\text{Log}\left[\frac{6}{5}\right] + \text{Log}\left[\text{Log}\left[\frac{6}{5}\right]\right]$$

```
fe[1.00000001]
```

$-1.00037 - 2.33621 \times 10^{-9}\,i$

```
FullSimplify[Sum[ ((-1) ^ (n - 1) esp3c[6, n, b] + 1) / n, {n, 1, Log[b, 6 / 4]}] -
    Sum[ ((-1) ^ (n - 1) esp3c[6, n, b] + 1) / n, {n, 1, Log[b, 6 / 5]}]]
```

$$\frac{1}{20}\left(-21 - 20\,\text{HarmonicNumber}\left[\frac{\text{Log}\left[\frac{6}{5}\right]}{\text{Log}[b]}\right] + 20\,\text{HarmonicNumber}\left[\frac{\text{Log}\left[\frac{3}{2}\right]}{\text{Log}[b]}\right] - \right.$$

$$\left. 24\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{6\,b}{5}\right]}{\text{Log}[b]}\right] + 30\,b\,\text{LerchPhi}\left[b,\,1,\,\frac{\text{Log}\left[\frac{3\,b}{2}\right]}{\text{Log}[b]}\right] - \frac{3\,(-1+b)\,\text{Log}\left[\frac{1875}{512}\right]}{b\,\text{Log}[b]}\right)$$

```
Limit[
```
$$\frac{1}{20}\left(-21 - 20\,\text{HarmonicNumber}\left[\frac{\text{Log}\left[\frac{6}{5}\right]}{\text{Log}[b]}\right] + 20\,\text{HarmonicNumber}\left[\frac{\text{Log}\left[\frac{3}{2}\right]}{\text{Log}[b]}\right] - \frac{3\,(-1+b)\,\text{Log}\left[\frac{1875}{512}\right]}{b\,\text{Log}[b]}\right),$$

```
    b -> 1]
```

$$-\frac{21}{20} - \frac{3}{20}\,\text{Log}\left[\frac{1875}{512}\right] - \text{Log}\left[\text{Log}\left[\frac{6}{5}\right]\right] + \text{Log}\left[\text{Log}\left[\frac{3}{2}\right]\right]$$