

```

Clear[g]
g[n_, k_, a_] := Sum[ ((-1)^(m+1))^(k-j) Binomial[k, j] g[Floor[n/m^(k-j)], j, m+1],
  {m, a, n^(1/k)}, {j, 0, k-1}];
g[n_, 1, a_] := (1/2) ((-1)^(n+1) + (-1)^(a+1))
g[n_, 0, a_] := 1
LAdd[n_] := Sum[ 2^k/k, {k, 1, Log[2, n]}]
LinE[n_] := LAdd[n] + Sum[ (-1)^(k+1)/k g[n, k, 2], {k, 1, Log[2, n]}]
{g[100, 1, 2], g[200, 1, 2], g[1000, 1, 2]}
{g[100, 2, 2], g[200, 2, 2], g[1000, 2, 2]}
{g[100, 3, 2], g[200, 3, 2], g[1000, 3, 2]}
{g[100, 4, 2], g[200, 4, 2], g[1000, 4, 2]}
LinE[100]

{-1, -1, -1}
{3, -1, -6}
{-4, -3, -19}
{-8, 6, -16}
428
15
N[LinE[100]]

28.5333

```

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Clear[g]
g[n_, k_, a_] :=
  If[n < a^k, 0, Sum[ (-1)^(k-j) Binomial[k, j] g[Floor[n/a^j], k-j, a+1], {j, 0, k}]];
g[n_, 1, a_] :=  $\frac{1}{2} + \frac{1}{2} (-1)^{a+n}$ 
g[n_, 0, a_] := 1
{$RecursionLimit = 10000};
LAdd[n_] := Sum[ 2^k/k, {k, 1, Log[2, n]}]
LinE[n_] := LAdd[n] - Sum[ 1/k g[n, k, 2], {k, 1, Log[2, n]}]

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LinE[100]

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g[n, 1, 2]

$$\text{If}\left[n < 2, 0, \sum_{j=0}^1 (-1)^{1-j} \text{Binomial}[1, j] \text{g}\left[\text{Floor}\left[\frac{n}{2^j}\right], 1-j, 2+1\right]\right]$$

$$\text{Expand}\left[\sum_{j=0}^1 (-1)^{1-j} \text{Binomial}[1, j] \text{g}\left[\text{Floor}\left[\frac{n}{2^j}\right], 1-j, 2+1\right]\right]$$

$$1 - \text{If}\left[\text{Floor}[n] < 3, 0, \sum_{j=0}^1 (-1)^{1-j} \text{Binomial}[1, j] \text{g}\left[\text{Floor}\left[\frac{\text{Floor}[n]}{3^j}\right], 1-j, 3+1\right]\right]$$

Table[{n, g[96, 1, n], (1/2 + 1/2 (-1)^(96+n))}, {n, 2, 7}] // TableForm

2	1	1
3	0	0
4	1	1
5	0	0
6	1	1
7	0	0

Expand[(1/2 + 1/2 (-1)^(n+a))]

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

Clear[g]

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

g[n_, 1, a_] := (1/2) ((-1)^(n+1) + (-1)^(a+1))

g[n_, 0, a_] := 1

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

LinE[n_] := LAdd[n] + Sum[(-1)^(k+1)/k g[n, k, 2], {k, 1, Log[2, n]}]

{g[100, 1, 2], g[200, 1, 2], g[1000, 1, 2]}

{g[100, 2, 2], g[200, 2, 2], g[1000, 2, 2]}

{g[100, 3, 2], g[200, 3, 2], g[1000, 3, 2]}

{g[100, 4, 2], g[200, 4, 2], g[1000, 4, 2]}

LinE[100]

{-1, -1, -1}

{3, -1, -6}

{-4, -3, -19}

{-8, 6, -16}

428

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```
{E2[100, 1], E2[200, 1], E2[1000, 1]}
{E2[100, 2], E2[200, 2], E2[1000, 2]}
{E2[100, 3], E2[200, 3], E2[1000, 3]}
{E2[100, 4], E2[200, 4], E2[1000, 4]}
```

```
{-1, -1, -1}
```

```
{3, -1, -6}
```

```
{-4, -3, -19}
```

```
{-8, 6, -16}
```

```
Clear[g]
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```
g[n_, k_, a_] := If[n < a^k, 0,
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Sum[(-1)^j Binomial[k, j] g[Floor[n / a^(k - j)], j, a + 1], {j, 0, k - 1}] +
Sum[(-1)^j Binomial[k, j] g[Floor[n / a^(k - j)], j, a + 1], {j, k, k}]
```

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];
```

```
g[n_, 0, a_] := 1
```

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{$RecursionLimit = 10 000};
```

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

```
LinE[n_] := LAdd[n] - Sum[1 / k g[n, k, 2], {k, 1, Log[2, n]}]
```

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LinE[100]
```

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{g[100, 3, 2], g[200, 3, 2], g[1000, 3, 2]}
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428
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```

```
{4, 3, 19}
```

```

Clear[g]
g[n_, k_, a_] := If[n < a^k, 0,
  Sum[((-1)^(a+1))^(k-j) Binomial[k, j] g[Floor[n/a^(k-j)], j, a+1], {j, 0, k-1}] +
  Sum[Binomial[k, j] g[Floor[n/a^(k-j)], j, a+1], {j, k, k}]
];
g[n_, 0, a_] := 1
{$RecursionLimit = 10 000};
LAdd[n_] := Sum[2^k/k, {k, 1, Log[2, n]}]
LinE[n_] := LAdd[n] - Sum[(-1)^(k+1)/k g[n, k, 2], {k, 1, Log[2, n]}]
LinE[100]
{g[100, 2, 2], g[200, 2, 2], g[1000, 2, 2]}
{g[100, 3, 2], g[200, 3, 2], g[1000, 3, 2]}
{g[100, 4, 2], g[200, 4, 2], g[1000, 4, 2]}

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{3, -1, -6}
{-4, -3, -19}
{-8, 6, -16}

Expand[((-1)^(a+1))^(k-j)]

((-1)^(1+a))^-j+k

```

```

Clear[g]
g[n_, k_, a_] := If[n < a^k, 0,

  Sum[((-1)^(a+1))^(k-j) Binomial[k, j] g[Floor[n/a^(k-j)], j, a+1], {j, 0, k-1}] +

  g[n, k, a+1]

];
g[n_, 1, a_] := (1/2) ((-1)^(n+1) + (-1)^(a+1))
g[n_, 0, a_] := 1
{$RecursionLimit = 10 000};
LAdd[n_] := Sum[2^k/k, {k, 1, Log[2, n]}]
LinE[n_] := LAdd[n] + Sum[(-1)^(k+1)/k g[n, k, 2], {k, 1, Log[2, n]}]
LinE[100]
{g[100, 2, 2], g[200, 2, 2], g[1000, 2, 2]}
{g[100, 3, 2], g[200, 3, 2], g[1000, 3, 2]}
{g[100, 4, 2], g[200, 4, 2], g[1000, 4, 2]}
428
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{3, -1, -6}
{-4, -3, -19}
{-8, 6, -16}
g[n, 1, a]
Table[{n, g[98, 1, n], fd[98, n]}, {n, 2, 8}] // TableForm
2      -1      -1
3       0       0
4      -1      -1
5       0       0
6      -1      -1
7       0       0
8      -1      -1
fd[n_, a_] := (1/2) ((-1)^(n+1) + (-1)^(a+1))
FullSimplify[(1/2) ((-1)^(n+1) + (-1)^(a+1))]
1
-- ((-1)^(1+a) + (-1)^(1+n))
2

```