```
StrictDivisorSummatory[n_, k_, a_] :=
 Sum[Binomial[k, j] StrictDivisorSummatory[Floor[n / (m^j)], k - j, m + 1],
  {j, 1, k}, {m, a, n^(1 / k)}]
StrictDivisorSummatory[n_, 1, a_] := n - a + 1
StrictDivisorSummatory[n_, 0, a_] := 1
CountOfPrimes[n_] :=
 Sum[(-1)^(k + 1) StrictDivisorSummatory[Floor[n^(1 / j)], k, 2] / k / j MoebiusMu[j],
  {j, 1, Log[2, n]}, {k, 1, Log[2, n^(1 / j)]}]
CountOfPrimes[10 000]
```

```
1229
```

```
DD[200, 2, 2]
```

```
699
```

```
D2[n_, a_] := 1 - 2 a + a^2 - Floor[n^(1 / 2)] + 2 Sum[Floor[n / m], {m, a, Floor[n^(1 / 2)]}]
D2[200, 2]
```

```
881
```

```
D2a[n_, a_] := Sum[1 + 2 (Floor[n / m] - (m + 1) + 1), {m, a, Floor[n^(1 / 2)]}]
D2a[200, 2]
```

```
699
```

```
D2b[n_, a_] := Sum[1 + 2 Floor[n / m] - 2 m, {m, a, Floor[n^(1 / 2)]}]
D2b[200, 2]
```

```
699
```

```
D2c[n_, a_] := Sum[1 - 2 m, {m, a, Floor[n^(1 / 2)]}]
D2c[n, a]
```

$$\left(-1+a-\text{Floor}\left[\sqrt{n}\right]\right)\left(-1+a+\text{Floor}\left[\sqrt{n}\right]\right)$$

```
D2d[n_, a_] :=
 (-1 + a - Floor[Sqrt[n]]) (-1 + a + Floor[Sqrt[n]]) + 2 Sum[Floor[n / m], {m, a, Floor[n^(1 / 2)]}]
D2d[200, 2]
```

```
699
```

```
Expand[(-1 + a - Floor[Sqrt[n]]) (-1 + a + Floor[Sqrt[n]])]
```

$$1-2\,a+a^2-\text{Floor}\left[\sqrt{n}\right]^2$$

```
D2e[n_, a_] := 1 - 2 a + a^2 - Floor[Sqrt[n]]^2 + 2 Sum[Floor[n / m], {m, a, Floor[n^(1 / 2)]}]
D2e[200, 2]
```

```
699
```

```
D2f[n_] := 1 - Floor[Sqrt[n]]^2 + 2 Sum[Floor[n / m], {m, 2, Floor[n^(1 / 2)]}]
D2f[200]
```

```
699
```

```
D3a[n_] :=
 Sum[1 + 3 Floor[n / (m^2)] - 3 m + 3 DD[Floor[n / m], 2, m + 1], {m, 2, Floor[n^(1 / 3)]}]
```

```
D3a[200]
```

```
1027
```

```
DD[200, 3, 2]
```

```
1027
```

```
D3b[n_] := (4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
  Sum[3 Floor[n / (m^2)] + 3 DD[Floor[n / m], 2, m + 1], {m, 2, Floor[n^(1 / 3)]}]
```

```
D3b[200]
```

```
1027
```

```
D3c[n_] := (4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
  3 Sum[Floor[n / (m^2)] + DD[Floor[n / m], 2, m + 1], {m, 2, Floor[n^(1 / 3)]}]
```

```
D3c[200]
```

```
1027
```

```
D3d[n_] := (4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
  3 Sum[Floor[n / (m^2)], {m, 2, Floor[n^(1 / 3)]}] + 3 Sum[
    DD[Floor[n / m], 2, m + 1], {m, 2, Floor[n^(1 / 3)]}]
```

```
D3d[200]
```

```
1027
```

```
D3e[n_] := (4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
  3 Sum[Floor[n / (m^2)], {m, 2, Floor[n^(1 / 3)]}] + 3 Sum[
    DD[Floor[n / m], 2, m + 1], {m, 2, Floor[n^(1 / 3)]}]
```

```
D2g[n_, a_] := 1 - 2 a + a^2 - Floor[Sqrt[n]]^2 + 2 Sum[Floor[n / m], {m, a, Floor[n^(1 / 2)]}]
```

```
D2g[200, 2]
```

```
699
```

```
D2h[n_, m_] := 1 - 2 m + m^2 - Floor[Sqrt[n]]^2 + 2 Sum[Floor[n / j], {j, m, Floor[n^(1 / 2)]}]
```

```
D2h[200, 2]
```

```
699
```

```
D3f[n_] := (4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
  3 Sum[Floor[n / (m^2)], {m, 2, Floor[n^(1 / 3)]}] + 3 Sum[
    m^2 - Floor[Sqrt[Floor[n / m]]]^2 + 2 Sum_{j=1+m}^{Floor[Sqrt[Floor[n / m]]]} Floor[Floor[n / m] / j], {m, 2, Floor[n^(1 / 3)]}]
```

```
D3f[200]
```

```
1027
```

```
D2h[Floor[n / m], m + 1]
```

```
FullSimplify[1 - 2 (1 + m) + (1 + m)^2 - Floor[Sqrt[Floor[n/m]]]^2 + 2 Sum[Floor[Floor[n/m]/j], {j, 1 + m, Floor[Sqrt[Floor[n/m]]]}]]
```

$$m^2 - \text{Floor}\left[\sqrt{\text{Floor}\left[\frac{n}{m}\right]}\right]^2 + 2 \sum_{j=1+m}^{\text{Floor}\left[\sqrt{\text{Floor}\left[\frac{n}{m}\right]}\right]} \text{Floor}\left[\frac{\text{Floor}\left[\frac{n}{m}\right]}{j}\right]$$

```
D3f[200]
```

1027

```
DD[200, 3, 2]
```

1027

```
D2h[Floor[n / m], m + 1]
```

$$1 - 2\,(1 + m) + (1 + m)^2 - \text{Floor}\left[\sqrt{\text{Floor}\left[\frac{n}{m}\right]}\right]^2 + 2 \sum_{j=1+m}^{\text{Floor}\left[\sqrt{\text{Floor}\left[\frac{n}{m}\right]}\right]} \text{Floor}\left[\frac{\text{Floor}\left[\frac{n}{m}\right]}{j}\right]$$

```
Expand[FullSimplify[3 Sum[ m^2, {m, 2, Floor[n^(1 / 3)]}]]]
```

$$-3 + \frac{1}{2}\,\text{Floor}\left[n^{1/3}\right] + \frac{3}{2}\,\text{Floor}\left[n^{1/3}\right]^2 + \text{Floor}\left[n^{1/3}\right]^3$$

```
FullSimplify[
  (4 - Floor[n^(1/3)] - 3 Floor[n^(1/3)]^2) / 2 + (-6 + Floor[n^(1/3)] + 3 Floor[n^(1/3)]^2 + Floor[n^(1/3)]^3) / 2]
```

$$\frac{1}{2}\left(-2 + \text{Floor}\left[n^{1/3}\right]^3\right)$$

```
D3g[n_] := (4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
   (-3 + 1/2 Floor[n^(1/3)] + 3/2 Floor[n^(1/3)]^2 + Floor[n^(1/3)]^3) +
  3 Sum[ Floor[ n / (m^2)], {m, 2, Floor[ n^(1 / 3)]}] + 3 Sum[
    -Floor[Sqrt[Floor[n/m]]]^2 + 2 Sum[Floor[Floor[n/m]/j], {j, 1 + m, Floor[Sqrt[Floor[n/m]]]}], {m, 2, Floor[ n^(1 / 3)]}]
```

```
D3g[200]
```

1027

```
FullSimplify[(4 - Floor[n^(1 / 3)] - 3 Floor[n^(1 / 3)]^2) / 2 +
   (-3 + 1/2 Floor[n^(1/3)] + 3/2 Floor[n^(1/3)]^2 + Floor[n^(1/3)]^3)]
```

$$-1 + \text{Floor}\left[n^{1/3}\right]^3$$

```
D3h[n_] := -1 + Floor[n^(1 / 3)]^3 + 3 Sum[ Floor[ n / (m^2)]
    - Floor[Floor[n / m]^(1 / 2)]^2 + 2 Sum[Floor[Floor[n/m]/j], {j, 1 + m, Floor[Sqrt[Floor[n/m]]]}], {m, 2, Floor[ n^(1 / 3)]
```

```
D3h[200]
```

```
1027
```

```
D3Unrolled[ n_ ] := -1 + Floor[ n^(1 / 3)]^3 +
  3 Sum[ Floor[ n / (m^2)] - Floor[ Floor[n / m]^(1 / 2)]^2 + 2 Sum[ Floor[Floor[n / m] / j],
       {j, m + 1, Floor[Floor[n / m]^(1 / 2)]}], {m, 2, Floor[n^(1 / 3)]}]
```

```
D3Unrolled[200]
```

```
1027
```

```
D3i[ n_, a_ ] := Sum[ 1 + 3 (Floor[n / (m^2)] - m) +
   3 Sum[ 1 + 2 Floor[n / (m j)] - 2 j, {j, m + 1, Floor[ Floor[ n / m]^(1 / 2)]}], {m,
   a, Floor[n^(1 / 2)]}]
```

```
D3i[200, 2]
```

```
826
```

```
D3j[ n_, a_ ] :=
 Sum[ 1 + 3 (Floor[n / (m^2)] - m) + 3 DD[Floor[n / m], 2, m + 1], {m, a, Floor[n^(1 / 2)]}]
```

```
D3j[100, 2]
```

```
228
```

```
StrictDivisorSummatory[ n, 2, 2 ]
```

```
$RecursionLimit::reclim : Recursion depth of 256 exceeded. ≫

$RecursionLimit::reclim : Recursion depth of 256 exceeded. ≫

$RecursionLimit::reclim : Recursion depth of 256 exceeded. ≫

General::stop : Further output of $RecursionLimit::reclim will be suppressed during this calculation. ≫

$IterationLimit::itlim : Iteration limit of 4096 exceeded. ≫

$IterationLimit::itlim : Iteration limit of 4096 exceeded. ≫
```

```
StrictDivisorSummatory[n, 1, 2]
```

```
StrictDivisorSummatory[n, 1, 2]
```

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

```
EE[100, 3, 2]
```

```
324
```

```
D32Unrolled[ n_ ] := -1 + Floor[ n^(1 / 3)]^3 +
  3 Sum[ Floor[ n / (m^2)] - Floor[ Floor[n / m]^(1 / 2)]^2 + 2 Sum[ Floor[Floor[n / m] / j],
       {j, m + 1, Floor[Floor[n / m]^(1 / 2)]}], {m, 2, Floor[n^(1 / 3)]}]
```

```
D2f[n_] := 1 - Floor[Sqrt[n]]^2 + 2 Sum[ Floor[n / m], {m, 2, Floor[n^(1 / 2)]}]
D22Unrolled[ n_ ] := 1 - Floor[ n^(1 / 2)]^2 + 2 Sum [ Floor[ n / m], {m, 2, Floor[n^(1 / 2)]}]
D22Unrolled[10 000]
```

73 669

```
EE[10 000, 2, 2]
```

73 669