```
P[ n_, k_ ] := Sum[ 1 / k - P[n / j, k + 1], {j, 2, n}]
```

```
Table[P[x, 1] - Sum[ PrimePi[ x^(1 / k) ] / k, {k, 1, 30}], {x, 1, 100}]
```

```
{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
```

```
ChebPsi[ n_ ] := Sum[ Log[j] - ChebPsi[n / j], {j, 2, n}]
```

```
Table[N[ChebPsi[x] - Sum[ MangoldtLambda[ j ], {j, 2, x}]] , {x, 2, 100}]
```

$$\{0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ -8.88178\times10^{-16},\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ -1.77636\times10^{-15},\ 0.,$$
$$0.,\ 1.77636\times10^{-15},\ 1.77636\times10^{-15},\ -3.55271\times10^{-15},\ 3.55271\times10^{-15},\ -3.55271\times10^{-15},$$
$$-3.55271\times10^{-15},\ -3.55271\times10^{-15},\ 0.,\ 0.,\ -3.55271\times10^{-15},\ 0.,\ 0.,\ 0.,\ 0.,$$
$$0.,\ -7.10543\times10^{-15},\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 7.10543\times10^{-15},\ 7.10543\times10^{-15},$$
$$0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ -1.42109\times10^{-14},\ -1.42109\times10^{-14},\ -1.42109\times10^{-14},$$
$$0.,\ -1.42109\times10^{-14},\ 1.42109\times10^{-14},\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ -1.42109\times10^{-14},\ 0.,$$
$$1.42109\times10^{-14},\ -1.42109\times10^{-14},\ -1.42109\times10^{-14},\ -2.84217\times10^{-14},\ 0.,\ -1.42109\times10^{-14},$$
$$-1.42109\times10^{-14},\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ -1.42109\times10^{-14},\ 1.42109\times10^{-14},\ 1.42109\times10^{-14},$$
$$0.,\ 1.42109\times10^{-14},\ 0.,\ 0.,\ 0.,\ 0.,\ -2.84217\times10^{-14},\ -2.84217\times10^{-14},\ 0.,\ 0.,$$
$$0.,\ 0.,\ 2.84217\times10^{-14},\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ 0.,\ -2.84217\times10^{-14},\ -2.84217\times10^{-14}\}$$

```
DD[n_, 1] := Floor[n] - 1
DD[n_, k_] := Sum[ DD[n / j, k - 1], {j, 2, n}]
PP[ n_ ] := Sum[ (-1)^(k + 1) / k DD[ n, k ], {k, 1, Log[2, n] }]
Table[PP[x] - Sum[ PrimePi[ x^(1 / k) ] / k, {k, 1, 30}], {x, 2, 100}]
```

```
{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
```

```
D2[n_, a_, 0 ] := 1
D2[n_, a_, 1 ] := Floor[n] - a + 1
D2[ n_, a_, k_ ] :=
 Sum[ Sum[ Binomial[k, j ] D2[ n / ( m^(k - j) ), m + 1, j], {j, 0, k - 1}], {m, a, n^(1 / k)}]
P2[ n_ ] := Sum[ (-1)^(k + 1) / k D2[ n, 2, k ], {k, 1, Log[2, n] }]
Table[P2[x] - Sum[ PrimePi[ x^(1 / k) ] / k, {k, 1, 30}], {x, 2, 100}]
```

```
{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
```

```
D2[100, 2, 2]
```

```
283
```

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

```
N[FF[100, 6]]
```

```
40.
```

```
Sum[ m, {m, 6, Floor[ 100^(1 / 2) ]}]
```

```
40
```

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

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

```
F2[ n_, a_] := -(Floor[n^(1 / 2)]^2) + a^2 - 2 a + 1 + 2 Sum[ Floor[ n / m], {m, a, n^(1 / 2)}]
```

```
F2[100, 3]
```

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```
N[1 - (Floor[ 100^(1 / 2)]^2) + 2 Sum[ Floor[ 100 / m], {m, 2, 100^(1 / 2)}]]
```

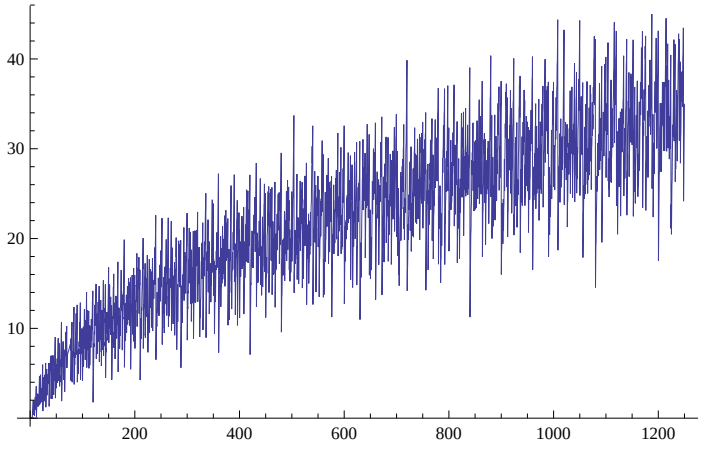
283.

```
F3[ n_, a_] := -(Floor[n^(1 / 2)]^2) + a^2 - 2 a + 1 +
  2 n (HarmonicNumber[ Floor[ n^(1 / 2)] ] - HarmonicNumber[ a - 1]) +
  -2 Sum[FractionalPart[ n / m], {m, a, n^(1 / 2)}]
```

```
N[F3[100, 2]]
```

283.

```
Plot[ 2 Sum[FractionalPart[ n / m], {m, 2, n^(1 / 2)}], {n, 1, 1250}]
```




```
D3[n_, a_, 0 ] := 1
D3[n_, a_, 1 ] := Floor[n] - a + 1
```

```
D3[ n_, a_, k_ ] :=
 Sum[ Sum[ Binomial[k, j ] (-1)^(k - j + 1) D3[ n / ( m^(k - j) ), m, j], {j, 0, k - 1}],
  {m, a, n^(1 / k)}]
```

```
D3[ 100, 3, 3]
```

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```
D2[100, 3, 3]
```

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