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

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

```
E2[n_, k_, b_] := Sum[E2[n / (j + 1), k - 1, b], {j, 1, n - 1}] -
  b Sum[E2[n / (b j), k - 1, b], {j, 1, n / b}]; E2[n_, 0, a_] := 1
EL2[n_, k_, b_] := Sum[EL2[n / (j + 1), k - 1, b], {j, 1, n - 1}] -
  b Sum[EL2[n / (j b), k - 1, b], {j, 1, n / b}]
EL2[n_, 1, b_] := Sum[Log[j + 1], {j, 1, n - 1}] - b Sum[Log[j b], {j, 1, n / b}]

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]}]
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}

```
N[EL2[100, 2, 2]]
```

6.44807

```
f1[n_, b_] := Sum[Log[k], {j, 2, n}, {k, 2, n / j}] -
  b Sum[Log[b k], {j, 2, n}, {k, 1, n / (b j)}] - b Sum[Log[k], {j, 1, n / b}, {k, 2, n / (b j)}] +
  b^2 Sum[Log[b k], {j, 1, n / b}, {k, 1, n / (b^2 j)}]
```

```
N[f1[100, 2]]
```

6.44807

```
f2[n_, b_] := b Sum[Log[k], {k, 2, n / b}] +
  Sum[Log[k], {j, 2, n}, {k, 2, n / j}] - 2 b Sum[Log[k], {j, 1, n / b}, {k, 2, n / (b j)}] +
  b^2 Sum[Log[k], {j, 1, n / b}, {k, 1, n / (b^2 j)}] -
  b Log[b] Sum[1, {j, 2, n}, {k, 1, n / (b j)}] +
  b^2 Log[b] Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]
```

```
N[f2[100, 2]]
```

6.44807

```
N[E2[1200, 2, 3]]
```

-20.

```
g1[n_, b_] := Sum[1, {j, 2, n}, {k, 2, n / j}] - b Sum[1, {j, 2, n}, {k, 1, n / (b j)}] -
  b Sum[1, {j, 1, n / b}, {k, 2, n / (b j)}] + b^2 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]
```

```
g1[1200, 3]
```

-20

```
g2[n_, b_] := Sum[1, {j, 2, n}, {k, 2, n / j}] -
  2 b Sum[1, {j, 2, n}, {k, 1, n / (b j)}] + b^2 Sum[1, {j, 1, n / b}, {k, 1, n / (b^2 j)}]
```

```
g2[1200, 3]
```

-20