

```

K[n_] := If[n == 1, 0, FullSimplify[MangoldtLambda[n] / Log[n]]]
P[n_, k_] := P[n, k] = Sum[K[j] P[Floor[n / j], k - 1], {j, 2, n}]; P[n_, 0] := 1
D2[n_, k_] := D2[n, k] = Sum[D2[Floor[n / j], k - 1], {j, 2, n}]; D2[n_, 0] := 1
DD[n_, z_] := Sum[FactorialPower[z, a] / a! D2[n, a], {a, 0, Log[2, n]}]
P[n_, k_, s_] := P[n, k, s] = Sum[j^(-s) K[j] P[Floor[n / j], k - 1, s], {j, 2, n}];
P[n_, 0, s_] := 1
DDa[n_, z_] := Sum[z^k / k! P[n, k], {k, 0, Log[2, n]}]
DDa[n_, z_, s_] := Sum[z^k / k! P[n, k, s], {k, 0, Log[2, n]}]
DDa2[n_, z_] := Sum[z^k / k! P[n, k] / z, {k, 0, Log[2, n]}]
Dhyp[n_, k_, a_] := Dhyp[n, k, a] =
  Sum[Binomial[k, j] Dhyp[Floor[n / (m^(k - j))], j, m + 1], {m, a, n^(1 / k)}, {j, 0, k - 1}]
Dhyp[n_, 1, a_] := Floor[n] - a + 1; Dhyp[n_, 0, a_] := 1
bins[z_, a_] := Product[(z - k), {k, 0, a - 1}] / a!
DDD[n_, z_] := Expand[Sum[bins[z, a] Dhyp[n, a, 2], {a, 0, Log[2, n]}]]
lin[n_] := Sum[(-1)^(k + 1) / k Dhyp[n, k, 2], {k, 1, Log[2, n]}]

```

```

df[n_, x_, k_, l_] := Sum[df[n / j, x, k, l - 1], {j, 1, x}]
df[n_, x_, k_, 0] := Dhyp[n, k, 1]
df2[n_, k_, x_] := x^(-k) Sum[(-1)^j Binomial[k, j] df[n x^k, x, k - j, j], {j, 0, k}]
di[n_, x_, k_, l_] := Sum[di[n / j, x, k, l - 1], {j, 2, x}]
di[n_, x_, k_, 0] := Dhyp[n, k, 2]
di2[n_, k_, x_] := x^(-k) Sum[(-1)^j Binomial[k, j] di[n x^k, x, k - j, j], {j, 0, k}]
di[100, 2, 2, 0]

```

283

df2[100, 3, 40]

$$\frac{5\,483\,447}{8000}$$

di2[100, 3, 40]

$$\frac{5\,483\,447}{8000}$$

Gamma[3, -Log[100]] / Gamma[3]

$$\frac{1}{2} \text{Gamma}[3, -\text{Log}[100]]$$

40^(-3) Dhyp[100 x 40^3, 3, 40 + 1]

$$\frac{5\,483\,447}{8000}$$

Binomial[3, 2]

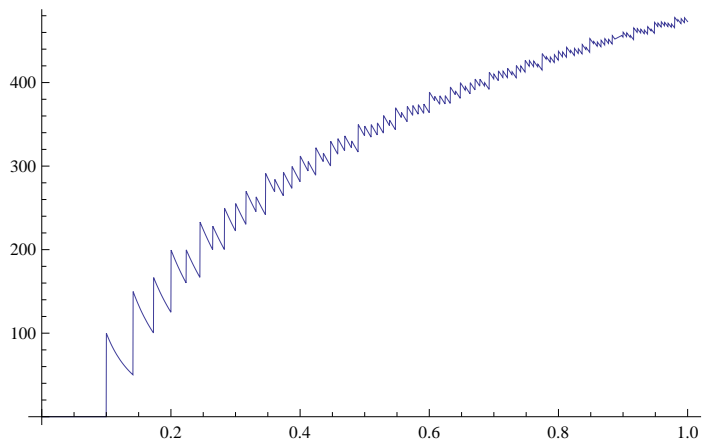
3

```

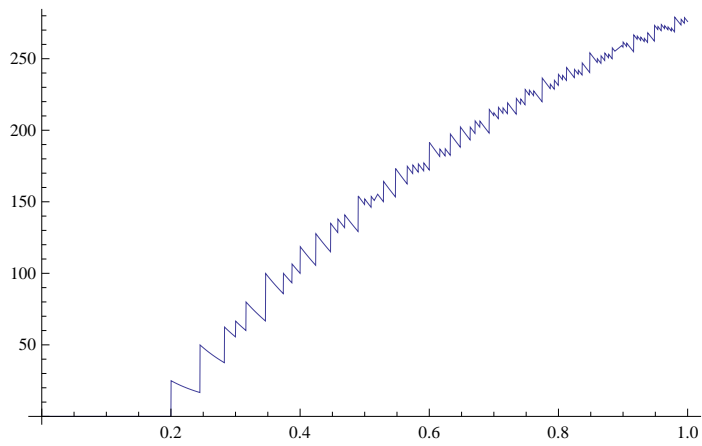
Binomial[2, 1]
2
f[x_] := Sum[1, {j, 2, x}, {k, 2, x}, {m, 2, x}]
Table[f[n] - f[n - 1], {n, 2, 40}] // TableForm
1
7
19
37
61
91
127
169
217
271
331
397
469
547
631
721
817
919
1027
1141
1261
1387
1519
1657
1801
1951
2107
2269
2437
2611
2791
2977
3169
3367
3571
3781
3997
4219
4447

```

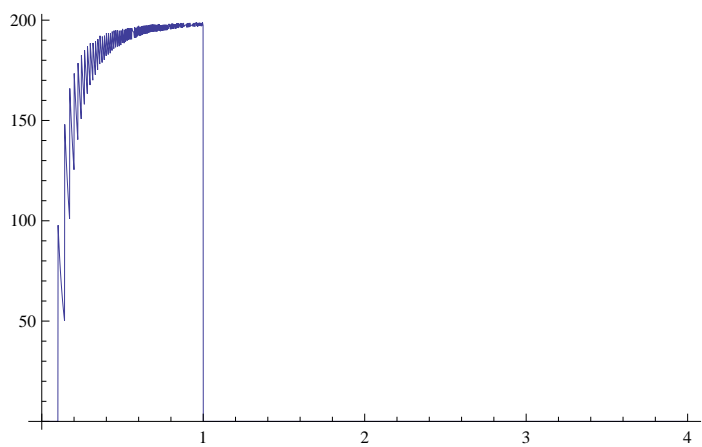
```
Plot[df2[100, 2, n], {n, 0, 1}]
```



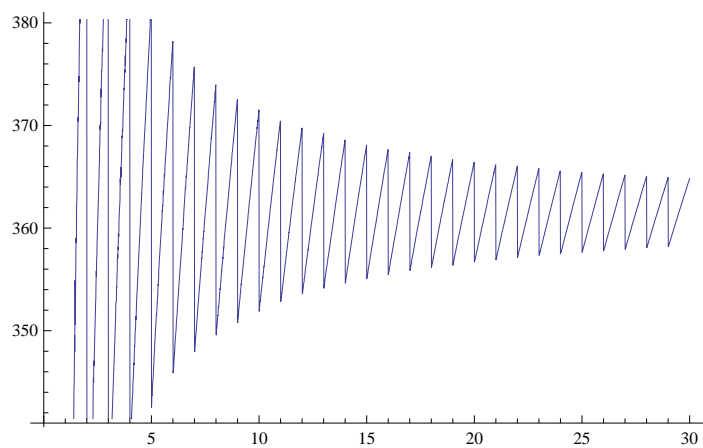
```
Plot[di2[100, 2, n], {n, 0, 1}]
```



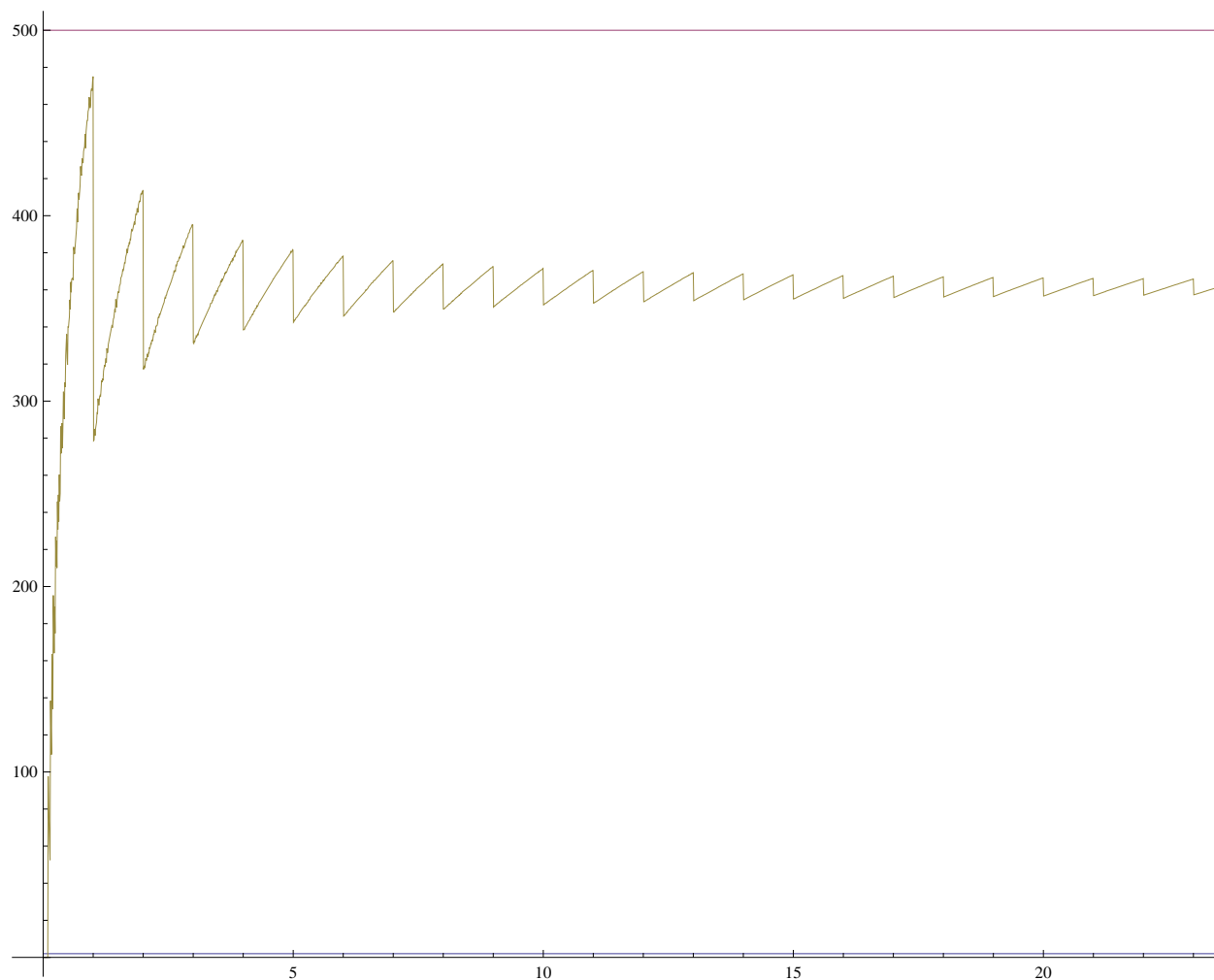
```
Plot[df2[100, 2, n] - di2[100, 2, n], {n, 0, 4}]
```



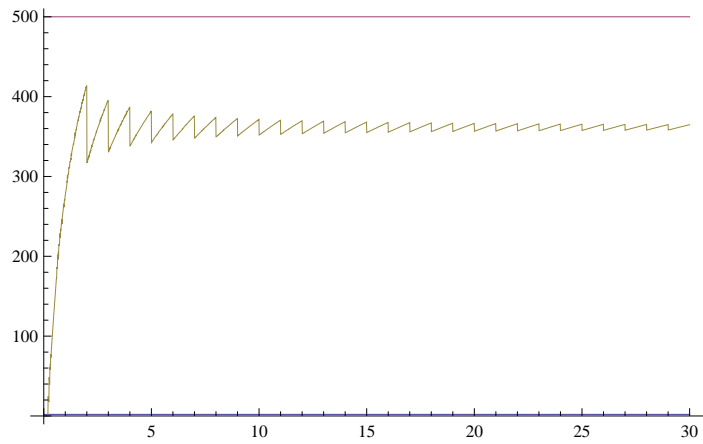
`Plot[di2[100, 2, n], {n, 0, 30}]`



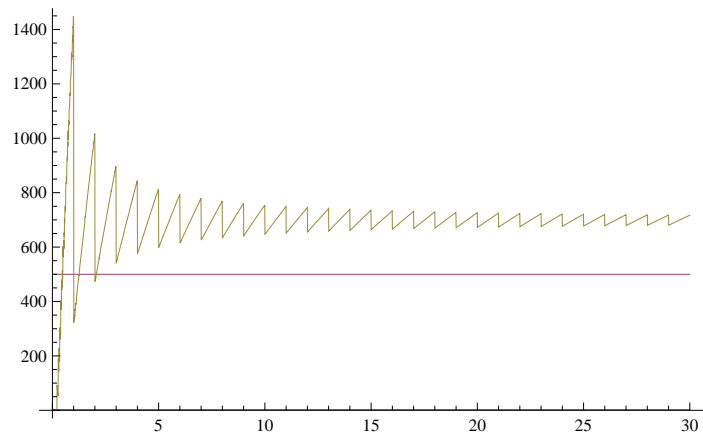
`Plot[{2, 500, df2[100, 2, n]}, {n, 0, 30}]`



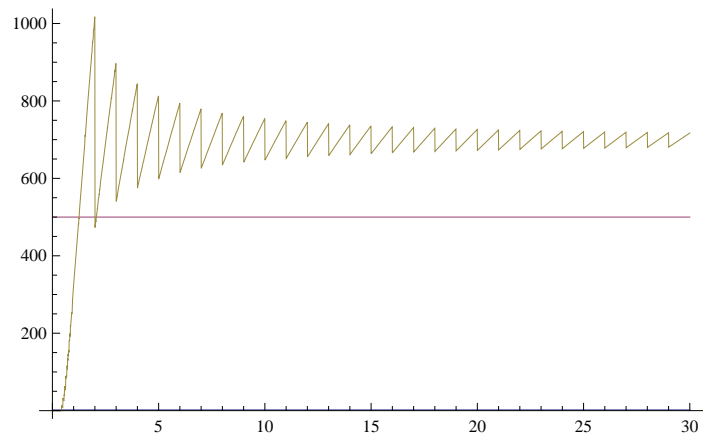
```
Plot[{2, 500, di2[100, 2, n]}, {n, 0, 30}]
```



```
Plot[{2, 500, df2[100, 3, n]}, {n, 0, 30}]
```



```
Plot[{2, 500, di2[100, 3, n]}, {n, 0, 30}]
```



```
Binomial[3, -1]
```

```
0
```

```
Binomial[0, -1]
```

```
0
```

```

dg[n_, x_, k_, l_] := Sum[dg[n / j, x, k, l - 1], {j, 1, x}]
dg[n_, x_, k_, 0] := DDD[n, k]
dg2[n_, k_, x_] := x^-k Sum[(-1)^j Binomial[k, j] dg[n x^k, x, k - j, j], {j, 0, k}]
dg2[100, 2.5, 5]
$Aborted

```