

```

D2[n_, k_, s_] := D2[n, k, s] = Sum[j^(-s) D2[Floor[n / j], k - 1, s], {j, 2, n}];
D2[n_, 0, s_] := 1
DD[n_, z_, s_] := Sum[FactorialPower[z, a] / a! D2[n, a, s], {a, 0, Log[2, n]}]

```

```
DD[100, 1, 0]
```

```
100
```

```
ff[n_] := Sum[(DD[j, -1, 0] - DD[j - 1, -1, 0]) D[DD[n / j, 1, s], s] /. s -> 0, {j, 1, n}]
```

```
N[ff[100]]
```

```
-94.0453
```

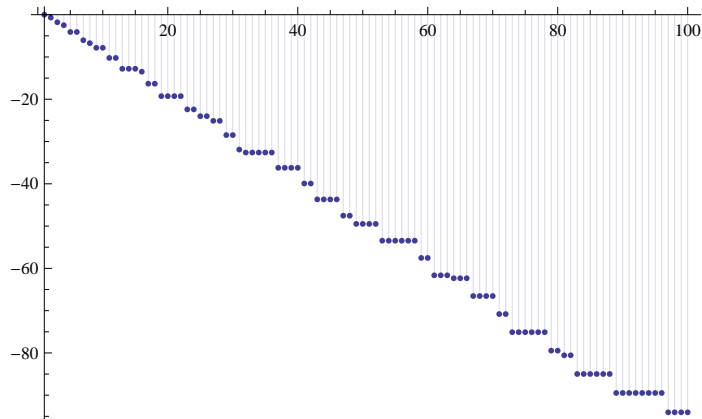
```
ff2[n_] := Sum[(DD[j, 1, 0] - DD[j - 1, 1, 0]) D[DD[n / j, -1, s], s] /. s -> 0, {j, 1, n}]
```

```
ff2[n_] := Sum[D[DD[n / j, -1, s], s] /. s -> 0, {j, 1, n}]
```

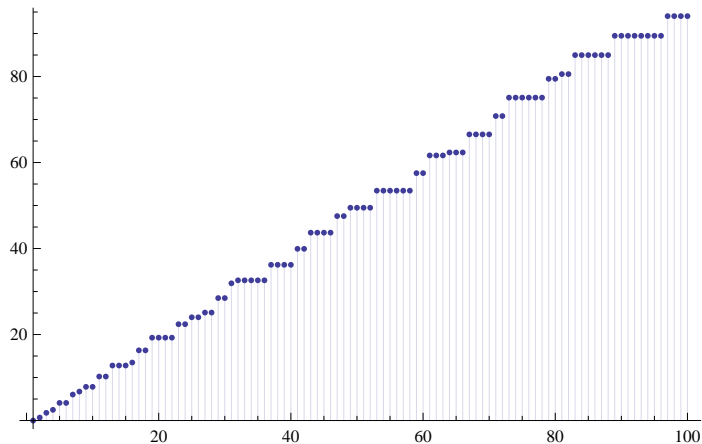
```
N[ff2[100]]
```

```
94.0453
```

```
DiscretePlot[-Sum[D[DD[n / j, -1, s], s] /. s -> 0, {j, 1, n}], {n, 1, 100}]
```



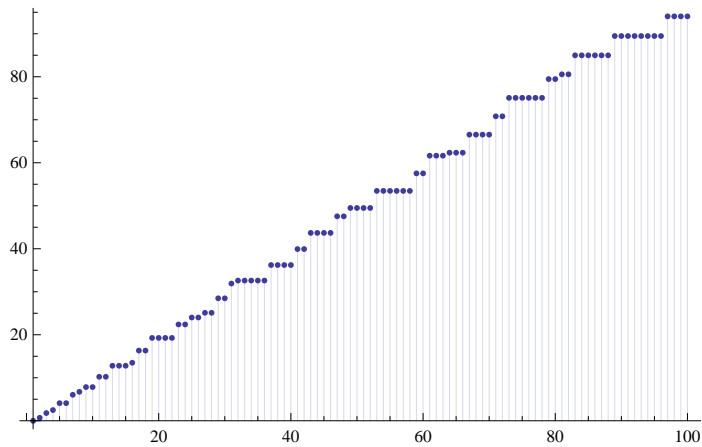
```
DiscretePlot[D[Sum[DD[n / j, -1, s], {j, 1, n}], {s, 1}] /. s -> 0, {n, 1, 100}]
```



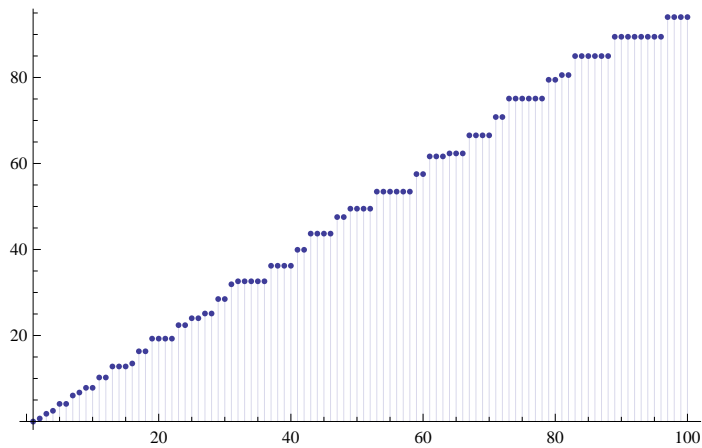
```
Sum[D[DD[3 / j, -1, s], {s, 1}] /. s -> 0, {j, 1, 3}]
```

```
Log[2] + Log[3]
```

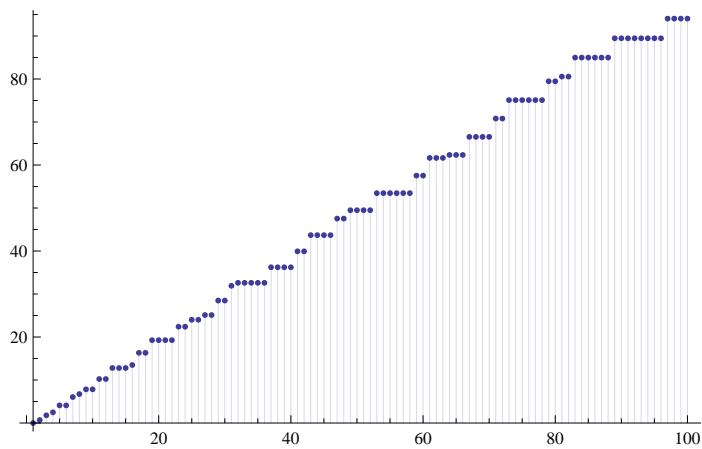
```
DiscretePlot[
  Sum[ (DD[j, 1, 0] - DD[j - 1, 1, 0]) D[DD[n / j, -1, s], s] /. s -> 0, {j, 1, n}], {n, 1, 100}]
```



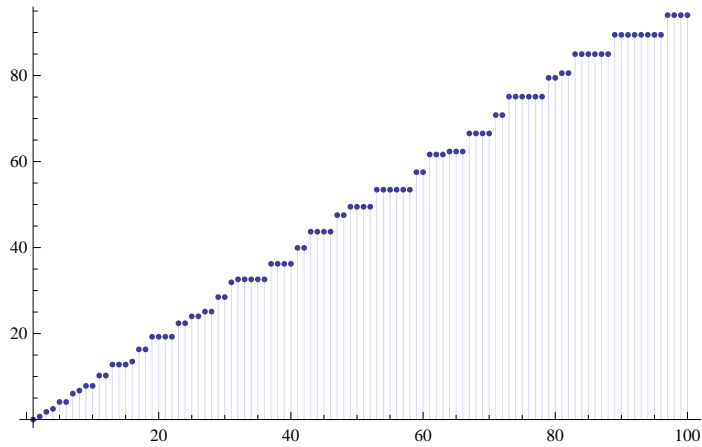
```
DiscretePlot[ Sum[
  (D[DD[j, -1, s], s] - D[DD[j - 1, -1, s], s]) DD[n / j, 1, 0] /. s -> 0, {j, 1, n}], {n, 1, 100}]
```



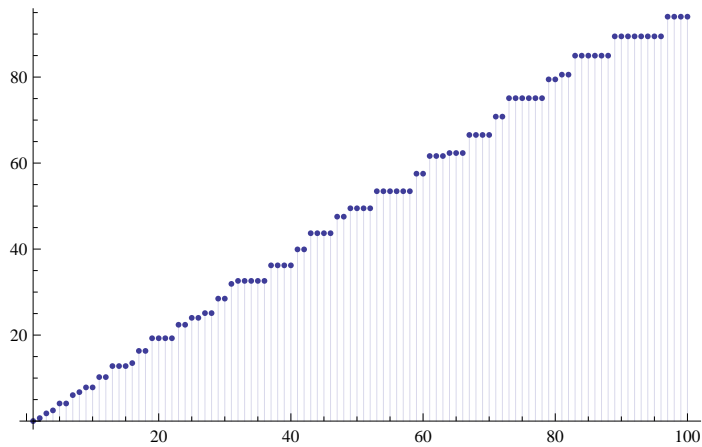
```
DiscretePlot[
  (1 / 2) Sum[ (D[DD[j, -2, s], s] - D[DD[j - 1, -2, s], s]) DD[n / j, 2, 0] /. s -> 0, {j, 1, n}],
  {n, 1, 100}]
```



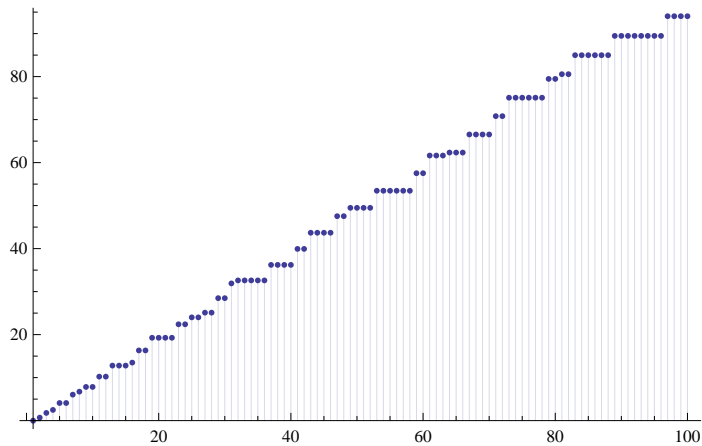
```
DiscretePlot[
  Sum[ (2) (D[DD[j, -1/2, s], s] - D[DD[j-1, -1/2, s], s]) DD[n/j, 1/2, 0] /. s -> 0,
    {j, 1, n}], {n, 1, 100}]
```



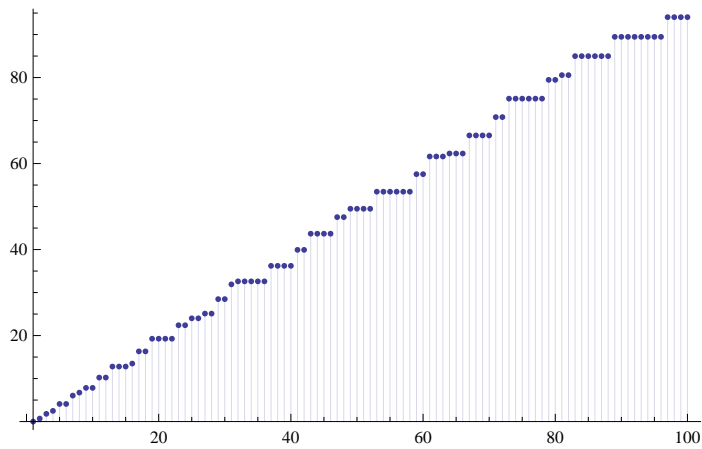
```
DiscretePlot[
  Sum[ 12 (D[DD[j, -1/12, s], s] - D[DD[j-1, -1/12, s], s]) DD[n/j, 1/12, 0] /. s -> 0,
    {j, 1, n}], {n, 1, 100}]
```



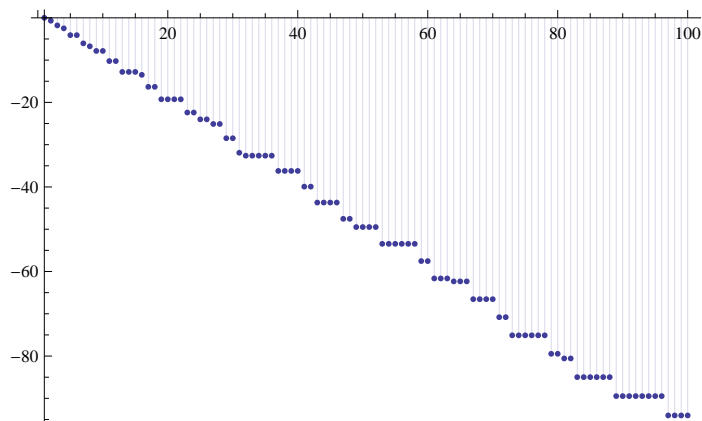
```
DiscretePlot[ Sum[
  (1/.0001) (D[DD[j, -.0001, s], s] - D[DD[j-1, -.0001, s], s]) DD[n/j, .0001, 0] /. s -> 0,
    {j, 1, n}], {n, 1, 100}]
```



```
DiscretePlot[
  Sum[ Limit[(1/z) (D[DD[j, -z, s], s] - D[DD[j-1, -z, s], s]) DD[n/j, z, 0] /. s -> 0, z -> 0],
    {j, 1, n}], {n, 1, 100}]
```



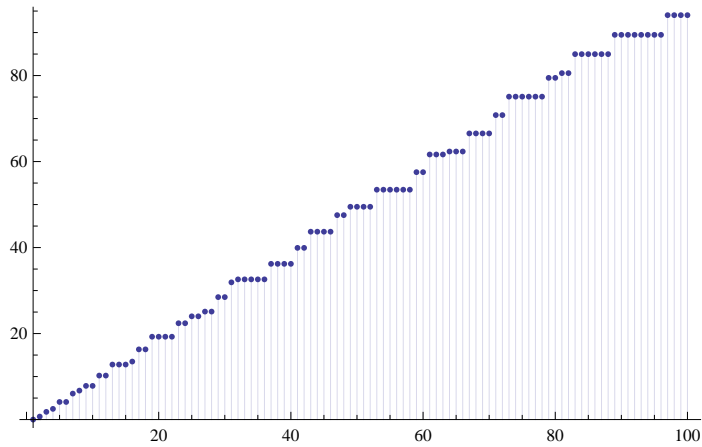
```
DiscretePlot[
  Sum[ Limit[(1/z) (DD[j, -z, 0] - DD[j-1, -z, 0]) D[DD[n/j, z, s], s] /. s -> 0, z -> 0],
    {j, 1, n}], {n, 1, 100}]
```



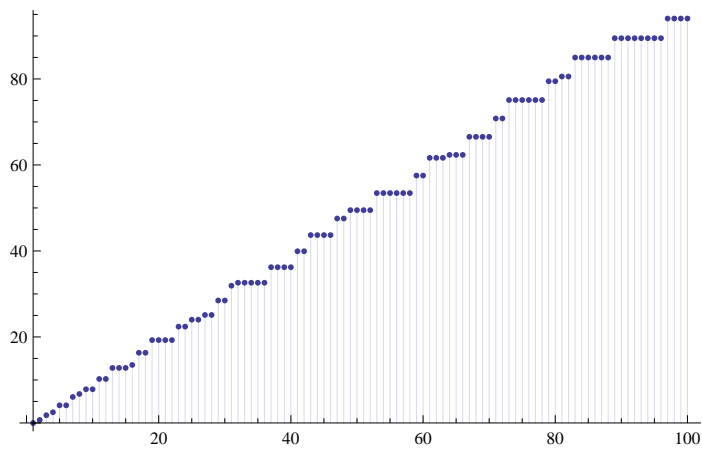
```
N[Limit[D[DD[100, z, s], s] / z /. s -> 0, z -> 0]]
```

```
-94.0453
```

```
DiscretePlot[
  Sum[ Limit[(1 / z) (D[DD[j, -z, s], s] - D[DD[j - 1, -z, s], s]) /. s -> 0, z -> 0], {j, 1, n}],
  {n, 1, 100}]
```



```
DiscretePlot[ Sum[ D[DD[n / j, -1, s], {s, 1}] /. s -> 0, {j, 1, n}], {n, 1, 100}]
```



```
Sum[ Limit[D[DD[100 / j, z, 0], {z, 1}], z -> -1], {j, 1, 100}]
```

428

15

```
N[Sum[ Limit[D[DD[100 / j, z, s], s] /. s -> 0, z -> -1], {j, 1, 100}]]
```

94.0453

```
N[ Limit[D[DD[100, z, s], z] /. s -> 0, z -> 0]]
```

28.5333