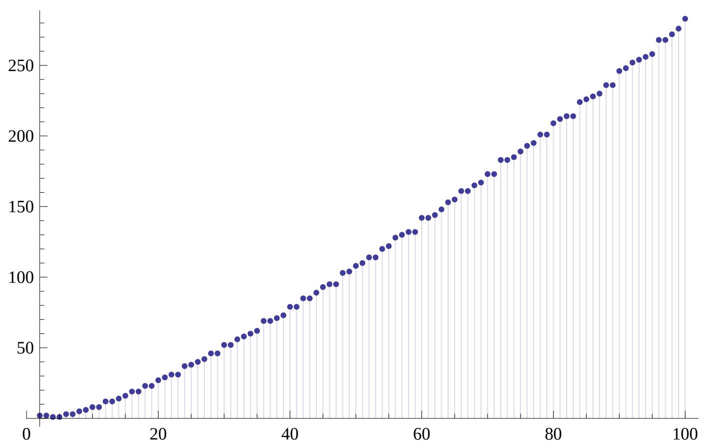
```
DiscretePlot[1 - Floor[√n]^2 + 2 Floor[n/2] + 2 Sum[Floor[n/m], {m, 3, Floor[√n]}], {n, 2, 100}]

DD[k_, a_, n_] :=
 Sum[Binomial[k, j] DD[k - j, m + 1, Floor[n / (m^j)]], {m, a, n^(1 / k)}, {j, 1, k}]
DD[1, a_, n_] := Floor[n] - a + 1
DD[0, a_, n_] := 1
DS[n_, k_] := DD[k, 2, n]
DDD[n_, k_] := Sum[DDD[n / j, k - 1], {j, 2, n}]
DDD[n_, 0] := 1
D2[1, a_, n_, p_, r_] := n - a + 1
D2[2, a_, n_, p_, r_] := p / ((r + 1) (r + 2)) + (Floor[n / a] - a) (p / (r + 1)) +
  (Floor[n^(1 / 2)] - a) (p / 2) + p Sum[Floor[n / m] - m, {m, a + 1, n^(1 / 2)}]
D2[k_, a_, n_, p_, r_] := D2[k - 1, a, n / a, p / (r + 1), r + 1] +
  Sum[D2[k - 1, m, n / m, p, 1], {m, a + 1, n^(1 / k)}]
DD2[n_, k_] := D2[k, 2, n, k!, 0]
D3[1, a_, n_, p_, r_] := p / (r + 1) + p (Floor[n] - a)
D3[k_, a_, n_, p_, r_] :=
 D3[k - 1, a, n / a, p / (r + 1), r + 1] + Sum[D3[k - 1, m, n / m, p, 1], {m, a + 1, n^(1 / k)}]
DD3[n_, k_] := D3[k, 2, n, k!, 0]
D4[1, a_, n_, p_, r_] := p (Floor[n] - a + 1) - p / (r + 1)
D4[k_, a_, n_, p_, r_] :=
 Sum[D4[k - 1, m, n / m, p, 1], {m, a, n^(1 / k)}] - D4[k - 1, a, n / a, p / (r + 1), r + 1]
DD4[n_, k_] := D4[k, 1, n, k!, 0]
```




```
DXX[n_] := 1 - Floor[√n]^2 + 2 Floor[n/2] + 2 Sum[Floor[n/m], {m, 3, Floor[√n]}]

DD2[2000, 2]
11519

DXX[2000]
11519

DDD[2000, 2]
11519
```

DD2[n, 2]

$$\texttt{FullSimplify}\left[-1+\text{Floor}\left[\sqrt{n}\right]+2\left(-2+\text{Floor}\left[\frac{n}{2}\right]\right)+2\sum_{m=3}^{\sqrt{n}}\left(-m+\text{Floor}\left[\frac{n}{m}\right]\right)\right]$$

$$-5+\text{Floor}\left[\sqrt{n}\right]+2\,\text{Floor}\left[\frac{n}{2}\right]+2\sum_{m=3}^{\sqrt{n}}\left(-m+\text{Floor}\left[\frac{n}{m}\right]\right)$$

$$\texttt{FullSimplify}\left[\left(2\sum_{m=3}^{\text{Floor}\left[\sqrt{n}\right]}(-m)\right)+\left(2\sum_{m=3}^{\text{Floor}\left[\sqrt{n}\right]}\left(\text{Floor}\left[\frac{n}{m}\right]\right)\right)\right]$$

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

$$\texttt{FullSimplify}\Big[$$

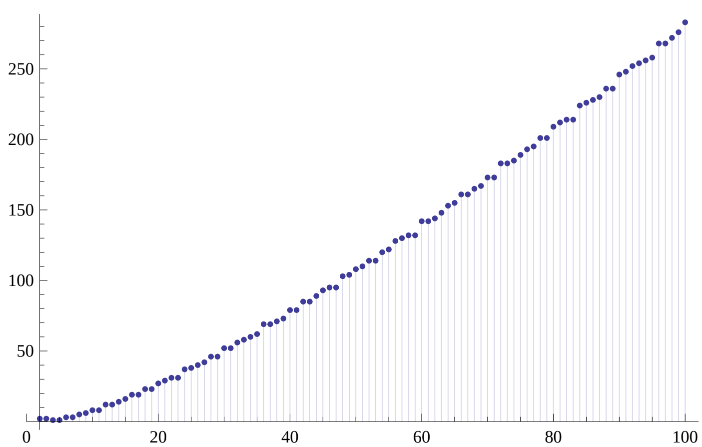
$$-1+\text{Floor}\left[\sqrt{n}\right]+2\left(-2+\text{Floor}\left[\frac{n}{2}\right]\right)+-\text{Floor}\left[\sqrt{n}\right]\left(1+\text{Floor}\left[\sqrt{n}\right]\right)+2\left(3+\sum_{m=3}^{\text{Floor}\left[\sqrt{n}\right]}\text{Floor}\left[\frac{n}{m}\right]\right)\Big]$$

$$1-\text{Floor}\left[\sqrt{n}\right]^2+2\,\text{Floor}\left[\frac{n}{2}\right]+2\sum_{m=3}^{\text{Floor}\left[\sqrt{n}\right]}\text{Floor}\left[\frac{n}{m}\right]$$

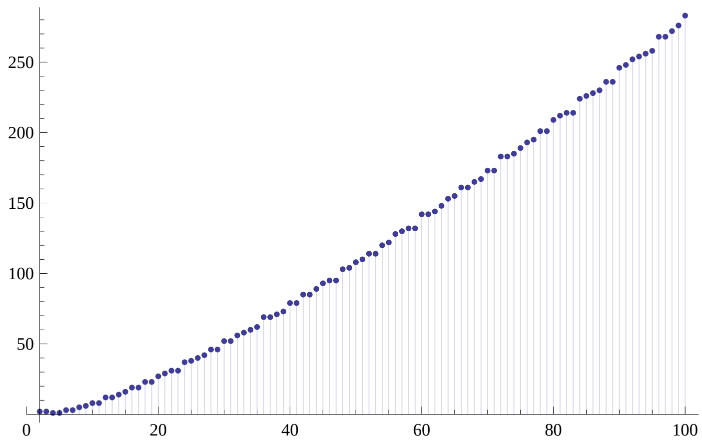
$$\texttt{FullSimplify}\left[-5+\text{Floor}\left[\sqrt{n}\right]+2\,\text{Floor}\left[\frac{n}{2}\right]+6-\sqrt{n}-n+2\sum_{m=3}^{\sqrt{n}}\text{Floor}\left[\frac{n}{m}\right]\right]$$

$$1-\sqrt{n}-n+\text{Floor}\left[\sqrt{n}\right]+2\,\text{Floor}\left[\frac{n}{2}\right]+2\sum_{m=3}^{\sqrt{n}}\text{Floor}\left[\frac{n}{m}\right]$$

$$\texttt{DiscretePlot}\left[1-\text{Floor}\left[\sqrt{n}\right]^2+2\,\text{Floor}\left[\frac{n}{2}\right]+2\sum_{m=3}^{\text{Floor}\left[\sqrt{n}\right]}\text{Floor}\left[\frac{n}{m}\right],\ \{n,\ 2,\ 100\}\right]$$

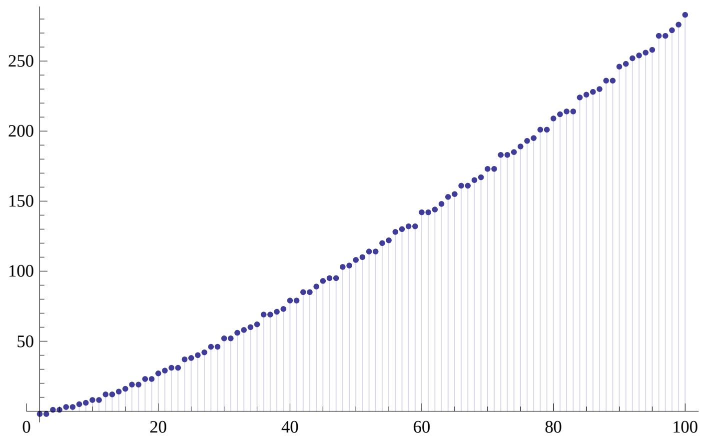


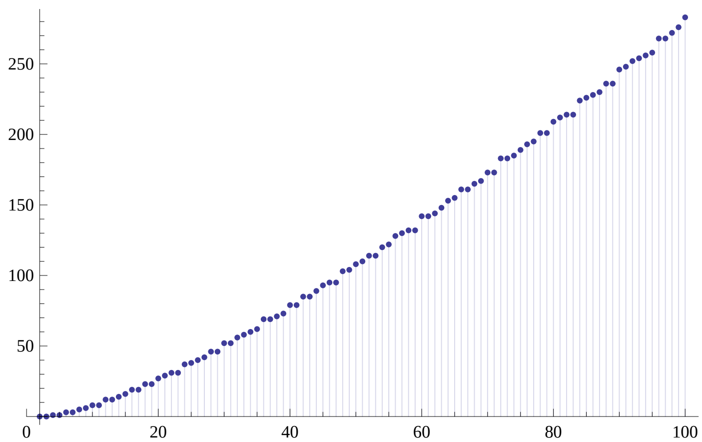
$$\text{DiscretePlot}\left[-1+\text{Floor}\left[\sqrt{n}\right]+2\left(-2+\text{Floor}\left[\frac{n}{2}\right]\right)+\right.$$
$$\left.-\text{Floor}\left[\sqrt{n}\right]\left(1+\text{Floor}\left[\sqrt{n}\right]\right)+2\left(3+\sum_{m=3}^{\text{Floor}\left[\sqrt{n}\right]}\text{Floor}\left[\frac{n}{m}\right]\right),\ \{n,\ 2,\ 100\}\right]$$



$$\text{DiscretePlot}\left[-1+\text{Floor}\left[\sqrt{n}\right]+2\left(-2+\text{Floor}\left[\frac{n}{2}\right]\right)+2\sum_{m=3}^{\sqrt{n}}\left(-m+\text{Floor}\left[\frac{n}{m}\right]\right),\ \{n,2,100\}\right]$$

```
DiscretePlot[ DDD[n, 2], {n, 2, 100}]
```






```
D5[1, a_, n_, p_, r_, s_] := s! / p / (r + 1) + (s! / p) (Floor[n] - a)
D5[k_, a_, n_, p_, r_, s_] := D5[k - 1, a, n / a, p (r + 1), r + 1, s + 1] +
  Sum[ D5[ k - 1, m, n / m, p, 1, s + 1], {m, a + 1, n^(1 / k)}]
DD5[ n_, k_] := D5[ k, 2, n, 1, 0, 1]
```

```
DD5[1000, 3]
```

11 217

```
DDD[1000, 3]
```

11 217

```
D6[1, a_, n_, p_, r_, s_] := p + (p (r + 1)) (Floor[n] - a)
D6[k_, a_, n_, p_, r_, s_] := D6[k - 1, a, n / a, p, 1, s + 1] +
  Sum[ D6[ k - 1, m, n / m, p (r + 1), r + 1, s + 1], {m, a + 1, n^(1 / k)}]
DD6[ n_, k_] := D6[ k, 2, n, 1, 0, 1]
```

```
DD6[1000, 3]
```

10 655

```
DA[ 1, n_, a_, k_, p_, r_ ] := (p / r + p (Floor[n] - a))
DA[s_, n_, a_, k_, p_, r_] := DA[s - 1, n / a, a, k + 1, k p / r, r + 1] +
  Sum[ DA[s - 1, n / m, m, k + 1, k p, 2], {m, a + 1, n^(1 / s)}]
DDA[ n_, s_] := DA[ s, n, 2, 2, 1, 1]
```

```
DDD[1000, 3]
```

11 217

```
DDA[1000, 3]
```

11 217

```
DB[ 1, n_, a_, k_, p_, r_ ] := p (Floor[n] - a + 1) - p / r
DB[s_, n_, a_, k_, p_, r_] := Sum[ DB[s - 1, n / m, m, k + 1, k p, 2], {m, a, n^(1 / s)}] -
  DB[s - 1, n / a, a, k + 1, k p / r, r + 1]
DDB[ n_, s_] := DB[ s, n, 1, 2, 1, 1]
```

```
DDD[1000, 3]
```

11 217

```
DDB[1000, 3]
```

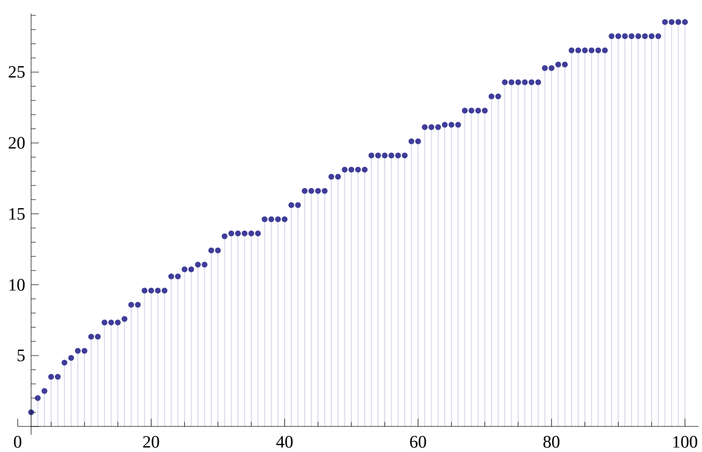
11 217

```
D7[a_, n_, p_, r_, s_] :=
 (s! / p / r + (s! / p) (Floor[n] - a)) / s -
  If[ n^(1 / 2) ≥ a , D7[a, n / a, p r, r + 1, s + 1] +
    Sum[ D7[m, n / m, p, 2, s + 1], {m, a + 1, n^(1 / 2)}], 0]
DD7[ n_] := D7[ 2, n, 1, 1, 1]
```

```
DD7[100]
```

$$\frac{428}{15}$$

```
DiscretePlot[ DD7[n], {n, 2, 100}]
```



```
D8[s_Number, n_Number, a_Integer, k_Integer, p_Integer, r_Integer] :=
 p (Floor[n / s] * s - a + 1 / r) -
  If[ n^(1 / 2) ≥ a ,
   Sum[ D8[s, n / m, m, k + 1, k p / r, r + 1] * s, {m, a, a + .999999, s}], 0] -
   Sum[ D8[s, n / m, m, k + 1, k p, 2] * s, {m, a + 1, n^(1 / 2), s}]
DD8[ n_, s_] := D8[ s, n, 1 + s, 1, 1, 1]

D8a[n_, a_, k_, p_, r_] :=
 p ( Floor[n] - a + 1 / r) -
  If[ n^(1 / 2) ≥ a , D8a[n / a, a, k + 1, k p / r, r + 1], 0] -
   Sum[ D8a[n / m, m, k + 1, k p, 2], {m, a + 1, n^(1 / 2)}]
DD8a[ n_] := D8a[ n, 2, 1, 1, 1]
```

```
DD8[100, .1]
```

29.3156

```
DD8[100, .2]
```

28.9508

```
DD8[100, .3]
```

30.848

```
DD8[100, .5]
```

29.2466

```
N[DD8[100, 1]]
```

28.5333

```
DD8[100, .05]
```

$Aborted

```
DD8a[ 100]
```

$$\frac{428}{15}$$

```
DD9[n_, k_, a_] :=
 Sum[ (-1)^(j - 1) Binomial[k, j] DD9[ n / (m^j), k - j, m], {j, 1, k}, {m, a, n^(1 / k)}]
DD9[n_, 0, a_] := 1
DD9[1000, 5, 2]
10 602
DDD[1000, 5]
10 602
DiscretePlot[DD9[n, 4, 2], {n, 2, 1000}]
```

$$\texttt{DiscretePlot}\left[2\sum_{m=3}^{\texttt{Floor}\left[\sqrt{n}\right]}\texttt{Floor}\left[\frac{n}{m}\right],\ \{n,\ 2,\ 100\}\right]$$