```
E2a[n_, k_, a_] :=
 E2a[n, k, a] = Sum[ E2a[n / j, k - 1, a], {j, 2, n}] - a Sum[ E2a[n / (a j), k - 1, a], {j, 1, n / a}];
E2a[n_, 0, a_] := 1
D2a[n_, k_] := D2a[n, k] = Sum[D2a[Floor[n / j], k - 1], {j, 2, n}]; D2a[n_, 0] := 1
DD[n_, z_] := DD[n, z] = Sum[FactorialPower[z, a] / a! D2a[n, a], {a, 0, Log[2, n]}]
EE[n_, z_, b_] :=
 EE[n, z, b] = Sum[FactorialPower[z, a] / a! E2a[n, a, b], {a, 0, Log[If[b > 2, 2, b], n]}]
```

```
EE[100, 2, 2]
```

2

```
DD[100, 2]
```

482

```
DD[100, 2] - 4 DD[50, 2] + 4 DD[25, 2]
```

2

```
f1[n_] := EE[n, 2, 2] + 4 DD[n / 2, 2] - 4 DD[n / 4, 2]
```

```
f1[100]
```

482

```
f2[n_] := EE[n, 2, 2] + 4 (EE[n / 2, 2, 2] + 4 DD[n / 4, 2] - 4 DD[n / 8, 2]) -
  4 (EE[n / 4, 2, 2] + 4 DD[n / 8, 2] - 4 DD[n / 16, 2])
```

```
f2[100]
```

482

```
Expand[EE[n, 2, 2] + 4 (EE[n / 2, 2, 2] + 4 DD[n / 4, 2] - 4 DD[n / 8, 2]) -
  4 (EE[n / 4, 2, 2] + 4 DD[n / 8, 2] - 4 DD[n / 16, 2])]
```

$$16\,\mathrm{DD}\left[\frac{n}{16},\,2\right]-32\,\mathrm{DD}\left[\frac{n}{8},\,2\right]+16\,\mathrm{DD}\left[\frac{n}{4},\,2\right]-4\,\mathrm{EE}\left[\frac{n}{4},\,2,\,2\right]+4\,\mathrm{EE}\left[\frac{n}{2},\,2,\,2\right]+\mathrm{EE}[n,\,2,\,2]$$

```
Sum[ Binomial[2 + j - 1, 2 - 1] 2^j EEa[100 / 2^j, 2, 2], {j, 0, Log[2, 100]}]
```

$$448\,\mathrm{EEa}\left[\frac{25}{16},\,2,\,2\right]+192\,\mathrm{EEa}\left[\frac{25}{8},\,2,\,2\right]+80\,\mathrm{EEa}\left[\frac{25}{4},\,2,\,2\right]+$$
$$32\,\mathrm{EEa}\left[\frac{25}{2},\,2,\,2\right]+12\,\mathrm{EEa}[25,\,2,\,2]+4\,\mathrm{EEa}[50,\,2,\,2]+\mathrm{EEa}[100,\,2,\,2]$$