$$[\zeta(0)^z]_n=$$

$$1+\sum_{a=2}^{n}\sum_{j=1}^{\lfloor\frac{\log n}{\log a}\rfloor}\binom{z}{j}\left(1+\sum_{b=a+1}^{\lfloor\frac{n}{a^j}\rfloor}\sum_{k=1}^{\lfloor\frac{\log n-j\log a}{\log b}\rfloor}\binom{z-j}{k}\cdot\left(1+\sum_{c=b+1}^{\lfloor\frac{n}{a^j b^k}\rfloor}\sum_{l=1}^{\lfloor\frac{\log n-j\log a-k\log b}{\log c}\rfloor}\binom{z-j-k}{l}\left(1+\sum_{d=c+1}^{\lfloor\frac{n}{a^j b^k c^l}\rfloor}\sum_{m=1}^{\lfloor\frac{\log n-j\log a-k\log b-l\log c}{\log d}\rfloor}\binom{z-j-k-l}{m}(1+\ldots)\right)\right)\right)$$

$$\Pi(n)=$$

$$\sum_{a=2}^{n}\sum_{j=1}^{\lfloor\frac{\log n}{\log a}\rfloor}\frac{(-1)^{j+1}}{j}\cdot\left(1+\sum_{b=a+1}^{\lfloor\frac{n}{a^j}\rfloor}\sum_{k=1}^{\lfloor\frac{\log n-j\log a}{\log b}\rfloor}\binom{-j}{k}\cdot\left(1+\sum_{c=b+1}^{\lfloor\frac{n}{a^j b^k}\rfloor}\sum_{l=1}^{\lfloor\frac{\log n-j\log a-k\log b}{\log c}\rfloor}\binom{-j-k}{l}\left(1+\sum_{d=c+1}^{\lfloor\frac{n}{a^j b^k c^l}\rfloor}\sum_{m=1}^{\lfloor\frac{\log n-j\log a-k\log b-l\log c}{\log d}\rfloor}\binom{-j-k-l}{m}(1+\ldots)\right)\right)\right)$$

$$\Pi(n)=$$

$$\sum_{a=2}^{n}\sum_{j=1}^{\lfloor\log_a n\rfloor}\frac{(-1)^{j+1}}{j}\cdot\left(1+\sum_{b=a+1}^{\lfloor\frac{n}{a^j}\rfloor}\sum_{k=1}^{\lfloor\log_b\frac{n}{a^j}\rfloor}\binom{-j}{k}\cdot\left(1+\sum_{c=b+1}^{\lfloor\frac{n}{a^j b^k}\rfloor}\sum_{l=1}^{\lfloor\log_c\frac{n}{a^j\cdot b^k}\rfloor}\binom{-j-k}{l}\left(1+\sum_{d=c+1}^{\lfloor\frac{n}{a^j b^k c^l}\rfloor}\sum_{m=1}^{\lfloor\log_d\frac{n}{a^j\cdot b^k\cdot c^l}\rfloor}\binom{-j-k-l}{m}(1+\ldots)\right)\right)\right)$$

$$[(\frac{1}{1-(1)})^{z}]_{n}=\sum_{a=0}^{n}\frac{z^{a}}{a!}\cdot\sum_{b=0}^{\lfloor\frac{1}{2}\cdot\frac{n}{a}\rfloor}\frac{(z/2)^{b}}{b!}\cdot\sum_{c=0}^{\lfloor\frac{1}{3}\cdot\frac{n}{a\cdot 2b}\rfloor}\frac{(z/3)^{c}}{c!}\cdot\sum_{d=0}^{\lfloor\frac{1}{4}\cdot\frac{n}{a\cdot 2b\cdot 3c}\rfloor}\frac{(z/4)^{d}}{d!}\cdot\ldots$$

$$[e^{z}]_{n}=\sum_{a=0}^{n}\frac{z^{(a)}}{a!}\cdot\sum_{b=0}^{\lfloor\frac{1}{2}\cdot\frac{n}{a}\rfloor}\frac{(-z/2)^{(b)}}{b!}\cdot\sum_{c=0}^{\lfloor\frac{1}{3}\cdot\frac{n}{a\cdot 2b}\rfloor}\frac{(-z/3)^{(c)}}{c!}\cdot\sum_{d=0}^{\lfloor\frac{1}{5}\cdot\frac{n}{a\cdot 2b\cdot 3c}\rfloor}\frac{(-z/5)^{(d)}}{d!}\cdot\ldots$$

$$\sum_{k=0}^{n}\frac{z^{(k)}}{k!}=\sum_{a=0}^{n}\frac{z^{a}}{a!}\cdot\sum_{b=0}^{\lfloor\frac{1}{2}\cdot\frac{n}{a}\rfloor}\frac{(z/2)^{b}}{b!}\cdot\sum_{c=0}^{\lfloor\frac{1}{3}\cdot\frac{n}{a\cdot 2b}\rfloor}\frac{(z/3)^{c}}{c!}\cdot\sum_{d=0}^{\lfloor\frac{1}{4}\cdot\frac{n}{a\cdot 2b\cdot 3c}\rfloor}\frac{(z/4)^{d}}{d!}\cdot\ldots$$

$$\sum_{k=0}^{n}\frac{z^{k}}{k!}=\sum_{a=0}^{n}\frac{z^{(a)}}{a!}\cdot\sum_{b=0}^{\lfloor\frac{1}{2}\cdot\frac{n}{a}\rfloor}\frac{(-z/2)^{(b)}}{b!}\cdot\sum_{c=0}^{\lfloor\frac{1}{3}\cdot\frac{n}{a\cdot 2b}\rfloor}\frac{(-z/3)^{(c)}}{c!}\cdot\sum_{d=0}^{\lfloor\frac{1}{5}\cdot\frac{n}{a\cdot 2b\cdot 3c}\rfloor}\frac{(-z/5)^{(d)}}{d!}\cdot\ldots$$

$$\boxed{\sum_{k=1}^{n}\frac{\mu(j)}{j}H_{\lfloor\frac{n}{j}\rfloor}=f(n)=1}$$

$$\boxed{\sum_{j=1}^{n}\frac{\mu(j)}{j}\sum_{k=1}^{\lfloor\frac{n}{j}\rfloor}\frac{1}{k}=f(n)=1}$$

$$\boxed{\int_{1}^{n}\frac{\frac{-1}{j}}{j}\left(\Gamma(0,\frac{n}{j})+\log\frac{n}{j}+\gamma\right)dj=?}$$

Suppose we look at the smoothing function version of D_z(n).

At ½.

$$D_z(n)=1+\binom{z}{1}\sum_{a\leq n,\, a=\frac{3}{2}} 1+\binom{z}{2}\sum_{a\cdot b\leq n,\, a,\, b=\frac{3}{2}} 1+\binom{z}{3}\sum_{a\cdot b\cdot c\leq n,\, a,\, b,\, c=\frac{3}{2}} 1+\ldots$$

3/2 = 1.5

9/4 = 2.25

27/8 = 3.375

81/16 = 5.0625

243/32 = 7.59375

729/64 = 11.3906

2187/128 = 17.0859

6561/256 = 25.6289

$$\boxed{[\eta(s)^z]_n = \sum_{j=1}^{n} \prod_{p^k | j} \begin{cases} p^{-sk} \cdot (-z) \cdot {}_2F_1(1-k\,;1-z\,;2\,;-1) & \text{if } p=2 \\ p^{-sk} \cdot \dfrac{z^{(k)}}{k\,!} & \text{if } p \neq 2 \end{cases}}$$

$$\boxed{{}_2F_1(a\,;b\,;c\,;z) = \sum_{n=0}^{\infty} \frac{a^{(n)} \cdot b^{(n)}}{c^{(n)}} \cdot \frac{z^n}{n\,!}}$$

$$\boxed{{}_2F_1(1-k\,;1-z\,;2\,;-1) = \sum_{n=0}^{\infty} \frac{(1-k)^{(n)} \cdot (1-z)^{(n)}}{2^{(n)}} \cdot \frac{(-1)^n}{n\,!}}$$

$$\boxed{[((1-x^{1-s})\zeta(s))^z]_n = \sum_{k=0} \frac{(-z)^{(k)}}{k\,!} \cdot x^{k(1-s)} [\zeta(s)^z]_{n \cdot x^{-k}}}$$

$$\boxed{[\eta(0)^z]_n = \sum_{k=0} \frac{(-z)^{(k)}}{k\,!} \cdot 2^k [\zeta(0)^z]_{n \cdot 2^{-k}}}$$