

Not sure what these notes were for. Doesn't look like anything too interesting.

$$\begin{aligned}
 D_1(n) - 1 &= \sum_{j=2}^n p(j) + \frac{1}{2} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} p(j) p(k) + \frac{1}{6} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \sum_{l=2}^{\lfloor \frac{n}{j \cdot k} \rfloor} p(j) p(k) p(l) + \dots \\
 D_2(n) - 1 &= 2 \sum_{j=2}^n p(j) + \frac{4}{2} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} p(j) p(k) + \frac{8}{6} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \sum_{l=2}^{\lfloor \frac{n}{j \cdot k} \rfloor} p(j) p(k) p(l) + \dots \\
 D_3(n) - 1 &= 3 \sum_{j=2}^n p(j) + \frac{9}{2} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} p(j) p(k) + \frac{27}{6} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \sum_{l=2}^{\lfloor \frac{n}{j \cdot k} \rfloor} p(j) p(k) p(l) + \dots
 \end{aligned}$$

$$\begin{aligned}
 D_1(n) &= P_0(n) + P_1(n) + \frac{1}{2} P_2(n) + \frac{1}{6} P_3(n) + \frac{1}{24} P_4(n) + \dots \\
 D_2(n) &= P_0(n) + 2 P_1(n) + \frac{4}{2} P_2(n) + \frac{8}{6} P_3(n) + \frac{16}{24} P_4(n) + \dots \\
 D_3(n) &= P_0(n) + 3 P_1(n) + \frac{9}{2} P_2(n) + \frac{27}{6} P_3(n) + \frac{81}{24} P_4(n) + \dots \\
 D_4(n) &= P_0(n) + 4 P_1(n) + \frac{16}{2} P_2(n) + \frac{64}{6} P_3(n) + \frac{256}{24} P_4(n) + \dots
 \end{aligned}$$

$$P_1(n) = D_1'(n) - \frac{1}{2} D_2'(n) + \frac{1}{3} D_3'(n) - \frac{1}{4} D_4'(n) + \dots$$

$$\sum_{j=1}^n \varphi(n) = \sum_{j=2}^n \kappa(j)(j-1) + \frac{1}{2} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \kappa(j) \kappa(k)(j-1)(k-1) + \frac{1}{6} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \sum_{l=2}^{\lfloor \frac{n}{j \cdot k} \rfloor} \kappa(j) \kappa(k) \kappa(l)(j-1)(k-1)(l-1) + \dots$$

$$\begin{aligned}
 \sum_{j=1}^n \varphi(n) &= \sum_{j=2}^n \kappa(j)(j-1) + \frac{1}{2} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \kappa(j) \kappa(k)(jk - j - k + 1) \\
 &+ \frac{1}{6} \sum_{j=2}^n \sum_{k=2}^{\lfloor \frac{n}{j} \rfloor} \sum_{l=2}^{\lfloor \frac{n}{j \cdot k} \rfloor} \kappa(j) \kappa(k) \kappa(l)(jkl - jk - jl - kl + j + k + l - 1) + \dots
 \end{aligned}$$

$$d_k(n) = \sum_{j|n} \kappa(j) + \frac{1}{2} \sum_{jk|n} \kappa(j) \kappa(k) + \frac{1}{6} \sum_{jkl|n} \kappa(j) \kappa(k) \kappa(l) + \dots$$