EMcLP-type e_1 formulas (with $x = 1$):

$$e_1 = \frac{1}{24} \log \frac{4}{(j-(j-2)z)^2} \qquad \text{(even valence)}$$

$$e_1 = \frac{1}{24} \log \frac{u^2 - 4z}{(j-(j-2)z)^2 - (j-2)^2 u^2 z} \qquad \text{(odd valence)}$$

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- Odd valence formula involves both u and z.
- Can we find formulas $e_g = F_g(y)$ for some sigle variable y?

y variable

$$y = u^2/z$$

$$B_1(y) = \sum_{\mu=0}^{(j-1)/2} \binom{j-1}{2\mu+1, j/2-1/2, j/2-3/2} y^{\mu}$$

$$B_2(y) = \sum_{\mu=0}^{(j-1)/2} \binom{j-1}{2\mu, j/2-1/2, j/2-1/2} y^{\mu}$$

y variable

$$
\begin{aligned}
y =& u^2/z \\
B_1(y) =& \sum_{\mu=0}^{(j-1)/2} \binom{j-1}{2\mu+1, j/2-1/2,\ j/2-3/2} y^{\mu} \\
B_2(y) =& \sum_{\mu=0}^{(j-1)/2} \binom{j-1}{2\mu,\ j/2-1/2, j/2-1/2} y^{\mu}
\end{aligned}
$$

$$
\begin{aligned}
\frac{z}{x} =& \frac{B_1(y)}{B_2(y) - yB_1(y)} \\
\frac{u^2}{x} =& \frac{yB_1(y)}{B_2(y) - yB_1(y)}
\end{aligned}
$$

e_1 expressed in terms of y

$$e_1 = \frac{1}{24} \log \frac{(4-y)(B_2(y) - yB_1(y))^2}{(2B_2(y) - jyB_1(y))^2 - (j-2)^2 y B_2(y)^2}$$

Examples

$$e_1 = \frac{(y^2-2)^2}{4 - 32y - 20y^2 - 8y^3 + y^4} \qquad \text{(j=5)}$$

$$e_1 = \frac{(4+6y-6y^2-y^3)^2}{16 - 288y - 684y^2 - 800y^3 - 72y^4 + y^6} \qquad \text{(j=7)}$$