$I_3^{D=4}(m^2, m^2, s_{12}; 0, m^2, 0)$

Page contributed by R.K. Ellis

Expression valid in the region $s_{12} < 0, m^2 > 0, \beta > 1$, $\beta^2 = 1 - \frac{4m^2}{s_{12}}$, from ref. [1] and see also Eq. (A7) of ref. [2] for an expression for the real part valid in the region $s_{12} > 4m^2$.

$$\lambda_\pm = \frac{1}{2}(1 \pm \beta)$$

$$I_3^{\{D=4\}}(m^2, m^2, s_{12}; 0, m^2, 0) = \frac{1}{s_{12}\beta}\left(\frac{2\pi^2}{3} + 2\mathrm{Li}_2\left(-\frac{\lambda_-}{\lambda_+}\right) + \frac{1}{2}\ln^2\left(-\frac{\lambda_-}{\lambda_+}\right)\right)$$

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References

[1] S. Dawson, R. K. Ellis and P. Nason (unpublished)

[2] W. Beenakker, H. Kuijf, W. L. van Neerven and J. Smith, Phys. Rev. D **40**, 54 (1989). Inspire