$I_3^{\{D=4\}}(0, s_2, s_3; m^2, m^2, m^2)$

Page contributed by R.K. Ellis

Expression valid in the region $s_2 < 0, s_3 < 0$,[1]

$$\begin{aligned} I_3^{\{D=4\}}(0, s_2, s_3; m^2, m^2, m^2) &= \frac{1}{s_2 - s_3}\left(s_2 I_3^{\{D=4\}}(0, 0, s_2; m^2, m^2, m^2) - s_3 I_3^{\{D=4\}}(0, 0, s_3; m^2, m^2, m^2) \right) \\ &= \frac{1}{2}\frac{1}{(s_2 - s_3)}\left(\ln^2\left(-\frac{\lambda_-^{(2)}}{\lambda_+^{(2)}} \right) - \ln^2\left(-\frac{\lambda_-^{(3)}}{\lambda_+^{(3)}} \right) \right) \end{aligned}$$

where

$$\lambda_\pm^{(j)} = \frac{1}{2}\left(1 \pm \sqrt{1 - \frac{4m^2}{s_j}}\right)$$

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References

[1] E. W. N. Glover and J. J. van der Bij, Nucl. Phys. B **321**, 561 (1989). Spires