Divergent Triangle Integral 2: $I_3^{\{D=4-2\epsilon\}}(0,p_2^2,p_3^2;0,0,0)$

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$$I_3^{\{D=4-2\epsilon\}}(0,p_2^2,p_3^2,0;0,0,0) = \frac{\mu^{2\epsilon}}{\epsilon^2}\left\{\frac{(-p_2^2-i\varepsilon)^{-\epsilon}-(-p_3^2-i\varepsilon)^{-\epsilon}}{p_2^2-p_3^2}\right\}$$

$$= \frac{1}{p_2^2-p_3^2}\left\{\frac{1}{\epsilon}\left[\ln\left(\frac{\mu^2}{-p_2^2-i\varepsilon}\right)-\ln\left(\frac{\mu^2}{-p_3^2-i\varepsilon}\right)\right]+\frac{1}{2}\left[\ln^2\left(\frac{\mu^2}{-p_2^2-i\varepsilon}\right)-\ln^2\left(\frac{\mu^2}{-p_3^2-i\varepsilon}\right)\right]\right\}+\mathcal{O}(\epsilon)$$

For $\epsilon, \varepsilon, \ln, \mathrm{Li}_2$ see the file on notation.

The expression with a mass cut-off is

$$I_3^{\{D=4\}}(p_2^2,p_3^2,0;\lambda^2,\lambda^2,\lambda^2) = \frac{1}{p_2^2-p_3^2}\left\{\frac{1}{2}\left[\ln^2\left(\frac{\lambda^2}{-p_2^2-i\varepsilon}\right)-\ln^2\left(\frac{\lambda^2}{-p_3^2-i\varepsilon}\right)\right]\right\}+\mathcal{O}(\lambda^2)$$

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References

[1] W. Beenakker, S. Dittmaier, M. Kramer, B. Plumper, M. Spira and P. M. Zerwas, Nucl. Phys. B **653**, 151 (2003) [arXiv:hep-ph/0211352]. [arXiv:hep-ph/0211352]