Raw amplitude

$$\int_{\lambda**2}^{\Lambda**2} dt \int \frac{d^4k}{(2\pi)^4} \frac{g_{\mu\nu} e^2 \bar{u}(p) \gamma^\mu \left(m + \left(-k_{\sigma_2} + p_{\sigma_2}\right) \gamma^{\sigma_2}\right) \gamma^\nu u(p)}{16\pi^4 \left(k - t\right)^2 \left(-2(pk) + k^2 - m^2 + p^2\right)} \tag{1}$$

Feynman parameterization

$$\int_0^1 dz_1 \int_0^{-z_1+1} dz_2 \int_0^{-z_1-z_2+1} dz_3 \int_{\lambda**2}^{\Lambda**2} dt \int \frac{d^4k}{(2\pi)^4} \frac{g_{\mu\nu} e^2 \bar{u}(p) \gamma^\mu \left(m + \left(-k_{\sigma_2} + p_{\sigma_2}\right) \gamma^{\sigma_2}\right) \gamma^\nu u(p)}{8\pi^4 \left(kz_1 + kz_2 - tz_1 - tz_2 - 2z_3(pk) + z_3 k^2 - z_3 m^2 + z_3 p^2\right)^3} \tag{2}$$

$$\frac{g_{\mu\nu} e^2 z_3 \left(-8ik_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8ip_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8i\pi^2 m\bar{u}(p)\gamma^\mu\gamma^\nu u(p)\right)}{8\pi^4 \left(kz_1 + kz_2 - tz_1 - tz_2 - 2z_3(pk) - z_3 m^2 + z_3 p^2\right)} \tag{3}$$

Starting...

$$\frac{z_3}{kz_1 + kz_2 - tz_1 - tz_2 - 2z_3(pk) - z_3 m^2 + z_3 p^2} \tag{4}$$

UV collecting...

$$\frac{z_3}{kz_1 + kz_2 - tz_1 - tz_2 - 2z_3(pk) - z_3 m^2 + z_3 p^2} \tag{5}$$

Simplifying...

$$\frac{C_2}{C_0 + C_1 t} \tag{6}$$

Integrating wrt t...

$$\frac{C_2}{C_1} \log\left(C_0 + C_1\Lambda^2\right) - \frac{C_2}{C_1} \log\left(C_0 + C_1\lambda^2\right) \tag{7}$$

Substituting constants...

$$\begin{aligned} &\frac{e^2}{8\pi^4} g_{\mu\nu} \left(\frac{z_3}{-z_1 - z_2} \log\left(\Lambda^2 \left(-z_1 - z_2\right) + kz_1 + kz_2 - 2z_3(pk) - z_3 m^2 + z_3 p^2\right) \right. \\ &\left. - \frac{z_3}{-z_1 - z_2} \log\left(\lambda^2 \left(-z_1 - z_2\right) + kz_1 + kz_2 - 2z_3(pk) - z_3 m^2 + z_3 p^2\right) \right) \left(-8ik_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8ip_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8i\pi^2 m\bar{u}(p)\gamma^\mu\gamma^\nu u(p)\right) \end{aligned} \tag{8}$$

Simplifying...

$$\frac{e^2}{8\pi^4} g_{\mu\nu} \left(\frac{z_3}{-z_1 - z_2} \log\left(\Lambda^2 \left(-z_1 - z_2\right) + k z_1 + k z_2 - 2 z_3 (pk) - z_3 m^2 + z_3 p^2\right) \right. \tag{9}$$
$$\left. - \frac{z_3}{-z_1 - z_2} \log\left(\lambda^2 \left(-z_1 - z_2\right) + k z_1 + k z_2 - 2 z_3 (pk) - z_3 m^2 + z_3 p^2\right) \right) \left(-8 i k_{\sigma_2} \pi^2 \bar{u}(p) \gamma^\mu \gamma^{\sigma_2} \gamma^\nu u(p) + 8 i p_{\sigma_2} \pi^2 \bar{u}(p) \gamma^\mu \gamma^{\sigma_2} \gamma^\nu u(p) + 8 i \pi^2 m \bar{u}(p) \gamma^\mu \gamma^\nu u(p)\right)$$

Starting...

$$\frac{z_3}{-z_1 - z_2} \log\left(\Lambda^2 \left(-z_1 - z_2\right) + k z_1 + k z_2 - 2 z_3 (pk) - z_3 m^2 + z_3 p^2\right) - \frac{z_3}{-z_1 - z_2} \log\left(\lambda^2 \left(-z_1 - z_2\right) + k z_1 + k z_2 - 2 z_3 (pk) - z_3 m^2 + z_3 p^2\right) \tag{10}$$

UV collecting...

$$\log\left(-\Lambda^2 \left(z_1 + z_2\right)\right) \tag{11}$$

Simplifying...

$$\log\left(C_0\right) \tag{12}$$

Integrating wrt z_3...

$$\left(-z_1 - z_2 + 1\right) \log\left(C_0\right) \tag{13}$$

Substituting constants...

$$\frac{e^2}{8\pi^4} g_{\mu\nu} \left(-z_1 - z_2 + 1\right) \log\left(-\Lambda^2 \left(z_1 + z_2\right)\right) \left(-8 i k_{\sigma_2} \pi^2 \bar{u}(p) \gamma^\mu \gamma^{\sigma_2} \gamma^\nu u(p) + 8 i p_{\sigma_2} \pi^2 \bar{u}(p) \gamma^\mu \gamma^{\sigma_2} \gamma^\nu u(p) + 8 i \pi^2 m \bar{u}(p) \gamma^\mu \gamma^\nu u(p)\right) \tag{14}$$

Simplifying...

$$\frac{e^2}{8\pi^4} g_{\mu\nu} \left(-z_1 - z_2 + 1\right) \log\left(-\Lambda^2 \left(z_1 + z_2\right)\right) \left(-8 i k_{\sigma_2} \pi^2 \bar{u}(p) \gamma^\mu \gamma^{\sigma_2} \gamma^\nu u(p) + 8 i p_{\sigma_2} \pi^2 \bar{u}(p) \gamma^\mu \gamma^{\sigma_2} \gamma^\nu u(p) + 8 i \pi^2 m \bar{u}(p) \gamma^\mu \gamma^\nu u(p)\right) \tag{15}$$

Starting...

$$\left(-z_1 - z_2 + 1\right) \log\left(-\Lambda^2 \left(z_1 + z_2\right)\right) \tag{16}$$

UV collecting...

$$\log\left(-\Lambda^2 \left(z_1 + z_2\right)\right) \tag{17}$$

Simplifying...

$$\log\left(C_1\left(C_0+z_2\right)\right) \tag{18}$$

Integrating wrt z_2...

$$-C_0\log\left(C_0\right)+C_0\log\left(C_0-z_1+1\right)+z_1+\left(-z_1+1\right)\log\left(C_1\left(C_0-z_1+1\right)\right)-1 \tag{19}$$

Substituting constants...

$$\frac{e^2}{8\pi^4}g_{\mu\nu}\left(-z_1\log\left(z_1\right)+z_1+\left(-z_1+1\right)\log\left(-\Lambda^2\right)-1\right)\left(-8ik_{\sigma_2}\pi^2\bar{u}(p)\gamma^{\mu}\gamma^{\sigma_2}\gamma^{\nu}u(p)+8ip_{\sigma_2}\pi^2\bar{u}(p)\gamma^{\mu}\gamma^{\sigma_2}\gamma^{\nu}u(p)+8i\pi^2m\bar{u}(p)\gamma^{\mu}\gamma^{\nu}u(p)\right) \tag{20}$$

Simplifying...

$$\frac{e^2}{8\pi^4}g_{\mu\nu}\left(-z_1\log\left(z_1\right)+z_1+\left(-z_1+1\right)\log\left(-\Lambda^2\right)-1\right)\left(-8ik_{\sigma_2}\pi^2\bar{u}(p)\gamma^{\mu}\gamma^{\sigma_2}\gamma^{\nu}u(p)+8ip_{\sigma_2}\pi^2\bar{u}(p)\gamma^{\mu}\gamma^{\sigma_2}\gamma^{\nu}u(p)+8i\pi^2m\bar{u}(p)\gamma^{\mu}\gamma^{\nu}u(p)\right) \tag{21}$$

Starting...

$$-z_1\log\left(z_1\right)+z_1+\left(-z_1+1\right)\log\left(-\Lambda^2\right)-1 \tag{22}$$

UV collecting...

$$\log\left(-\Lambda^2\right) \tag{23}$$

Simplifying...

$$\log\left(C_0\right) \tag{24}$$

Integrating wrt z_1...

$$\log\left(C_0\right) \tag{25}$$

Substituting constants...

$$\frac{e^2}{8\pi^4}g_{\mu\nu}\log\left(-\Lambda^2\right)\left(-8ik_{\sigma_2}\pi^2\bar{u}(p)\gamma^{\mu}\gamma^{\sigma_2}\gamma^{\nu}u(p)+8ip_{\sigma_2}\pi^2\bar{u}(p)\gamma^{\mu}\gamma^{\sigma_2}\gamma^{\nu}u(p)+8i\pi^2m\bar{u}(p)\gamma^{\mu}\gamma^{\nu}u(p)\right) \tag{26}$$

Simplifying...

$$\frac{e^2}{8\pi^4} g_{\mu\nu} \log\left(-\Lambda^2\right) \left(-8ik_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8ip_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8i\pi^2 m\bar{u}(p)\gamma^\mu\gamma^\nu u(p)\right) \tag{27}$$

$$\frac{e^2}{8\pi^4} g_{\mu\nu} \log\left(-\Lambda^2\right) \left(-8ik_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8ip_{\sigma_2}\pi^2 \bar{u}(p)\gamma^\mu\gamma^{\sigma_2}\gamma^\nu u(p) + 8i\pi^2 m\bar{u}(p)\gamma^\mu\gamma^\nu u(p)\right) \tag{28}$$