**Angular Integrals**

$$
\begin{aligned}
\int d^4k \frac{\Gamma(k)}{k^2(p-k)^2} &= \pi^2 \int_0^{p^2} dk^2 \frac{\Gamma(k)}{p^2} + \pi^2 \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k)}{k^2} \\
\int d^4k \frac{\Gamma(k) p.k}{k^4(p-k)^2} &= \frac{\pi^2}{2} \int_0^{p^2} dk^2 \frac{\Gamma(k)}{p^2} + \frac{\pi^2}{2} \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k) p^2}{k^4} \\
\int d^4k \frac{\Gamma(k) (p.k)^2}{k^4(p-k)^2} &= \frac{\pi^2}{4} \int_0^{p^2} dk^2 \frac{\Gamma(k)(k^2+p^2)}{p^2} + \frac{\pi^2}{4} \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k) p^2 (p^2+k^2)}{k^4} \\
\int d^4k \frac{\Gamma(k)}{k^2(p-k)^4} &= \pi^2 \int_0^{p^2} dk^2 \frac{\Gamma(k)}{p^2(p^2-k^2)} + \pi^2 \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k)}{k^2(k^2-p^2)} \\
\int d^4k \frac{\Gamma(k) p.k}{k^2(p-k)^4} &= \pi^2 \int_0^{p^2} dk^2 \frac{\Gamma(k) k^2}{p^2(p^2-k^2)} + \pi^2 \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k) p^2}{k^2(k^2-p^2)} \\
\int d^4k \frac{\Gamma(k) (p.k)^2}{k^4(p-k)^4} &= \frac{\pi^2}{4} \int_0^{p^2} dk^2 \frac{\Gamma(k)(3k^2+p^2)}{p^2(p^2-k^2)} + \frac{\pi^2}{4} \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k) p^2 (k^2+3p^2)}{k^4(k^2-p^2)} \\
\int d^4k \frac{\Gamma(k) (p.k)^3}{k^4(p-k)^4} &= \frac{\pi^2}{2} \int_0^{p^2} dk^2 \frac{\Gamma(k) k^2 (k^2+p^2)}{p^2(p^2-k^2)} + \frac{\pi^2}{2} \int_{p^2}^{\Lambda^2} dk^2 \frac{\Gamma(k) p^4 (p^2+k^2)}{k^4(k^2-p^2)}
\end{aligned}
$$