FORMULA 4.252.1

$$\int_0^\infty \frac{x^{\mu-1}\,\ln x\,dx}{(x+\beta)(x+\gamma)} = \frac{\pi}{(\gamma-\beta)\sin\pi\mu}\left[\beta^{\mu-1}\ln\beta - \gamma^{\mu-1}\ln\gamma - \pi\cot\pi\mu\left(\beta^{\mu-1}-\gamma^{\mu-1}\right)\right]$$