! For an efficient use of these tables, first read `HowTo.pdf`.

T3.54B. Integrands involving logarithm functions and powers of logarithm functions and rational functions on the interval $(1, \infty)$.

1. $\displaystyle\int_1^\infty \frac{\ln(x-1)}{1+x^2}\,dx = \frac{\pi}{8}\ln 2.$

2. $\displaystyle\int_1^\infty x^{\mu-1}\ln(1+x)\,dx = -\frac{1}{\mu}[\beta(-\mu)+\ln 2], \quad \Re\{\mu\} < 0.$

3. $\displaystyle\int_1^\infty x^{\mu-1}\ln(x-1)\,dx = \frac{1}{\mu}[\pi\cot(\mu\pi)+\psi(\mu+1)+\gamma_e], \quad \Re\{\mu\} < 0.$

4. $\displaystyle\int_1^\infty \ln(1+x^2)\frac{dx}{1+x^2} = \frac{\pi}{2}\ln 2 + \mathbf{G}.$

5. $\displaystyle\int_1^\infty \ln(x^2-1)\frac{dx}{1+x^2} = \frac{\pi}{4}\ln 2 + \mathbf{G}.$

6. $\displaystyle\int_1^\infty \ln\frac{1+x^2}{x+1}\,\frac{dx}{1+x^2} = \frac{3\pi}{8}\ln 2.$

7. $\displaystyle\int_1^\infty \ln\frac{1+x^2}{x-1}\,\frac{dx}{1+x^2} = \frac{3\pi}{8}\ln 2 + \mathbf{G}.$
