FORMULA 4.231.7

$$\int_0^\infty \frac{\ln x\, dx}{(a^2+b^2x^2)^n} = \frac{\Gamma(n-\frac{1}{2})\sqrt{\pi}}{4(n-1)!\, a^{2n-1}b}\left[2\ln\left(\frac{a}{2b}\right) - \gamma - \psi\left(n-\frac{1}{2}\right)\right]$$