

! For an efficient use of these tables, first read [HowTo.pdf](#).

T2.51A. Integrands involving trigonometric functions and rational polynomials of degree k for $k = 1, 2, 3, 4, n$, on the interval $(0, \pi/4)$.

$$1. \int_0^{\pi/4} x \tan x \, dx = -\frac{\pi}{8} \ln 2 + \frac{1}{2} \mathbf{G}.$$

$$2. \int_0^{\pi/4} x \cot x \, dx = \frac{\pi}{8} \ln 2 + \frac{1}{2} \mathbf{G}.$$

$$3. \int_0^{\pi/4} x^m \tan x \, dx = \frac{1}{2} \left(\frac{\pi}{4} \right)^m \sum_{k=1}^{\infty} \frac{(4^k - 1) \zeta(2k)}{4^{2k-1} (m + 2k)}.$$

$$4. \int_0^{\pi/4} x^m \cot x \, dx = \frac{1}{2} \left(\frac{\pi}{4} \right)^m \left(\frac{2}{m} - \sum_{k=1}^{\infty} \frac{\zeta(2k)}{4^{2k-1} (m + 2k)} \right).$$
