

置換積分

$y = \tan^{-1} x$ とおくと $dy/dx = 1/(x^2 + 1)$ より

$$\begin{aligned} I &= \int_0^{\pi/4} y dy = \left[\frac{y^2}{2} \right]_0^{\pi/4} \\ &= \frac{\pi^2}{32} \end{aligned}$$