

$$\begin{aligned}
 \textcircled{11} \quad \int_0^{\frac{\pi}{4}} \tan x \, dx &= \int_0^{\frac{\pi}{4}} \frac{\sin x}{\cos x} \, dx = \int_0^{\frac{\pi}{4}} \frac{-dt}{t} = -\ln|t| = -\ln|\cos x| \Big|_0^{\frac{\pi}{4}} \\
 &= -\ln \frac{\sqrt{2}}{2} + \ln 1 = -\ln 2^{-\frac{1}{2}} \\
 &= \ln 2^{\frac{1}{2}} = \frac{1}{2} \ln 2
 \end{aligned}$$

$\int \frac{\sin x}{\cos x} dx = \int -\frac{dt}{t}$