

$$30. \frac{1}{u(u+1)} = \frac{A}{u} + \frac{B}{u+1}, u = \tan x, du = \sec^2 x dx$$

$$1 = A(u+1) + Bu$$

When $u = 0$, $A = 1$.

When $u = -1$, $1 = -B \Rightarrow B = -1$.

$$\begin{aligned} \int \frac{\sec^2 x dx}{\tan x(\tan x + 1)} &= \int \frac{1}{u(u+1)} du \\ &= \int \left(\frac{1}{u} - \frac{1}{u+1} \right) du \\ &= \ln|u| - \ln|u+1| + C \\ &= \ln \left| \frac{u}{u+1} \right| + C \\ &= \ln \left| \frac{\tan x}{\tan x + 1} \right| + C \end{aligned}$$