$\int \tan x \sec^2 x \, dx$

a)

$u = \tan x$

$du = \sec^2 x \, dx$

$\int u \, du = \frac{1}{2}u^2 = \boxed{\frac{1}{2}\tan^2 x + C}$

b)

$u = \sec x$

$du = \sec x \tan x \, dx$

$\int u \, du = \frac{1}{2}u^2 = \boxed{\frac{1}{2}\sec^2 x + C}$

c)

$\frac{1}{2}\tan^2 x + C_1 = \frac{1}{2}\sec^2 x + C_2$

$C_1 - C_2 = \frac{1}{2}(\sec^2 x - \tan^2 x)$

$\boxed{C_1 - C_2 = \frac{1}{2}}$