

19g

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

$$u = \tan x$$

$$\frac{du}{dx} = \sec^2 x$$

$$\frac{du}{\sec^2 x} = dx$$

$$u = \tan^2 x$$

$$\frac{du}{dx} = 2 \tan x \cdot \sec^2 x$$

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

$$= \int \sec^2 x u^2 \cdot \frac{du}{\sec^2 x}$$

$$= \int u^2 \, du$$

$$= \frac{u^3}{3} + C$$

$$= \frac{\tan^3 x}{3} + C$$