

Name:

Section: 7 8

1. Differentiate $g(x) = \ln(\cos x)$.

$$g'(x) = \frac{1}{\cos x} \cdot (-\sin x)$$

2. Evaluate $\int 2xe^{x^2} dx$

$$u = x^2$$

$$du = 2x dx$$

$$\int e^u du$$

$$= e^u + C$$

$$= e^{x^2} + C$$

3. Differentiate $y = (\tan x)^x$. Use logarithmic differentiation

$$\Rightarrow \ln y = \ln((\tan x)^x) = x \cdot \ln \tan x$$

$$\Rightarrow \frac{y'}{y} = 1 \cdot \ln \tan x + \frac{1}{\tan x} \cdot \sec^2 x$$

$$\Rightarrow y' = (\tan x)^x \cdot \left[\ln \tan x + \frac{\sec^2 x}{\tan x} \right]$$