Name: Section: 5 6 9 10

1. Differeniate $g(x) = 7^{\sqrt{x}}$.

$$g'(x) = 7^{\sqrt{x}} \cdot \ln 7 \cdot \frac{1}{2} x^{-1/2}$$

2. Evaluate $\int e^{\cos x} \sin x \, dx$

$u = \cos x$

$du = -\sin x \, dx$

$-du = \sin x \, dx$

$$= \int e^u (-du)$$

$$= -\int e^u du$$

$$= -e^u + C = -e^{\cos x} + C$$

3. Differentiate $y = (\cos x)^x$.

$$\ln y = x \cdot \ln(\cos x)$$

$$\frac{y'}{y} = 1 \cdot \ln(\cos x) + x \cdot \frac{1}{\cos x} \cdot (-\sin x)$$

$$y' = (\cos x)^x \left(\ln(\cos x) + x \cdot \frac{1}{\cos x} (-\sin x) \right)$$

$$= (\cos x)^x \left(\ln(\cos x) - x \tan x \right)$$