MAT 202 7.3, 7.4
Spring, 2013 Name_____

1. Find the derivative of y with respect to x:

   a. $y = \ln\left(5xe^{2x}\right)$

   b. $y = \int_{e^{4\sqrt{x}}}^{e^{2x}} \ln(t)\,dt$

   c. $y = x^{\pi}$

   d. $y = \pi^{x}$

   e. $y = 2^{\cos(3x)}$

2. Evaluate the integrals.

   a. $\int_{\pi/4}^{\pi/2} \left(e^{\cot(w)} + 1\right)\csc^2(w)\,dw$

   b. $\int_{0}^{\sqrt{\ln(\pi)}} 2xe^{x^2}\cos\left(e^{x^2}\right)dx$

   c. $\int 7^{x}\,dx$

   d. $\int_{1}^{4} \frac{3^{\sqrt{x}}}{\sqrt{x}}\,dx$

   e. $\int_{1/10}^{10} \frac{\log_{10}(10x)}{x}\,dx$

3. Solve the differential equation.

   a. $\frac{dy}{dt} = e^{t}\sin\left(e^{t} - 2\right),\ y(\ln(2)) = 0$

   b. $\frac{d^2y}{dx^2} = 2e^{-x},\ y(0) = 1, y'(0) = 0$