

**Math2B - Practice Midterm 2**

February 21, 2007

- (a): Differentiate the function  $f(x) = -7e^{x \cos(x)}$ .  
(b): Evaluate the integral  $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$ .
- (a): Differentiate the function  $f(x) = x^2 \ln(1 - x^2)$ .  
(b): Evaluate the integral  $\int_e^6 \frac{1}{x \ln x} dx$ .
- (a): Solve the equation for  $x$ ,  $2 \ln x = \ln 2 + \ln(3x - 4)$ .  
(b): Use logarithmic differentiation to find the derivative of  $y = \frac{x^8(x-9)^7}{(x^2+2)^4}$ .
- (a): Find the derivative of the function  $y = \sin^{-1}(2x + 1)$ .  
(b): Evaluate the integral  $\int_0^{\pi/2} \frac{\sin x}{1 + \cos^2 x} dx$ .
- Use L'Hospital's rule to find the limit:  
(a):  $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$ .  
(b):  $\lim_{x \rightarrow 0^+} x^x$ .
- Evaluate the integral using integration by parts  
(a):  $\int x e^{-x} dx$   
(b):  $\int_1^2 \frac{\ln x}{x^2} dx$ .