Math2B - Practice Midterm 2

February 23, 2009

1. (a): Differentiate the function $f(x) = -7e^{x\cos(x)}$.
   (b): Evaluate the integral $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$.

2. (a): Differentiate the function $f(x) = x^2 \ln(1 - x^2)$.
   (b): Evaluate the integral $\int_e^6 \frac{1}{x \ln x} dx$.

3. (a): Use a triangle to simply $\cos(\tan^{-1} x)$.
   (b): Evaluate the integral, $\int \frac{e^x}{\sqrt{1-e^{2x}}}$.

4. Evaluate the integral using integration by parts
   (a): $\int xe^{-x} dx$
   (b): $\int_1^2 \frac{\ln x}{x^2} dx$.

5. Evaluate the integrals
   (a): $\int_{-\pi/2}^0 \cos^3 x \sin x dx$
   (b): $\int_{-\pi/4}^{\pi/4} \tan^4 x \sec^2 x dx$