MATH 114 – 25 MARCH 2013 – EXAM 2

Answer each of the following questions on the answer sheets provided. Do not do any work on this question sheet. When you are done, hand in this question sheet together with your answer sheets. Show all work, as partial credit may be given. This exam will be counted out of 80 points.

1. (10 pts. each) Use integration by parts to compute each of the following integrals.

(a) $\int_1^2 \frac{\ln(x)}{x^3}\, dx$

(b) $\int e^x \sin(x)\, dx$

2. (10 pts.) Compute the following integral using trigonometric substitution. $\int \frac{dx}{x^2(x^2 - 9)^{1/2}}$.

3. (10 pts.) Compute the following integral using partial fractions. $\int_2^3 \frac{x}{(x-1)(x+2)^2}\, dx$.

4. (10 pts. each) Compute each of the following trigonometric integrals.

(a) $\int \cos^3(x) \sin^4(x)\, dx$

(b) $\int \sec^4(x)\, dx$

5. (10 pts. each) Compute the following improper integrals. If the integral is divergent (that is, if it is infinite), then so state.

(a) $\int_2^\infty \frac{\ln(x)}{x^3}\, dx$. (Hint: Integrate by parts. No need to duplicate work already done.)

(b) $\int_0^2 x^{-2/5}\, dx$.