MATH 2260

Midterm Exam II

November 13, 2007

NAME (please print legibly): _____

Your University ID Number: _____

Please complete all questions in the space provided. Draw a box around your final answer. You may use the backs of the pages for extra space, or ask me for more paper if needed. Work carefully, and neatly (part of your grade will be based on how well your work is presented).

Try to complete the problems you find easier before going back to the harder ones. Good luck!

QUESTION	VALUE	SCORE
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
TOTAL	60	

1. (10 points) Find the indefinite integral:

$$\int x \sec^2 x \, dx.$$

2. (10 points) Compute the definite integral:

$$\int_0^{\pi/2} \cos^3 x \, dx.$$

3. (10 points) Integrate

$$\int \frac{x^3}{\sqrt{x^2+4}}\,dx.$$

4. (10 points) Integrate

$$\int \frac{2x+1}{x^2-7x+12}\,dx.$$

5. (10 points) Does the **sequence**

$$a_n = \frac{\ln n}{\ln 2n}$$

have a limit? If so, what is the value of that limit? (A correct guess is worth 2 points. For full credit, justify your answer.)

6. (10 points) Does the series

$$\sum_{n=1}^{\infty} \frac{\ln n}{n}$$

converge or diverge? Use the integral test to find the answer. (A correct guess, perhaps obtained by another method, is worth 2 points.)