

NOTICE: This Material May Be Protected  
By Copyright Law (Title 17, U.S. Code)

**MATH 213: MIDTERM1 (FALL 2006)**

Name: \_\_\_\_\_

Section: \_\_\_\_\_ TA: \_\_\_\_\_

Score:

Problem 1. \_\_\_\_\_

Problem 2. \_\_\_\_\_

Problem 3. \_\_\_\_\_

Problem 4. \_\_\_\_\_

Problem 5. \_\_\_\_\_

Total: \_\_\_\_\_

**Instruction:** Show all work. No work = no credit, even if you have a correct answer. References and calculator are not allowed.

Problem 1 (10 points): (a) Evaluate  $\int_0^2 (x^3 - x)dx$  by the fundamental theorem of calculus.

(b) Approximate  $\int_0^3 xdx$  by the trapezoidal rule with  $n = 3$ .

Problem 2 (10 points): Solve the indefinite integral  $\int \sqrt{x} \ln x dx$ .

Problem 3 (10 points): Find the area between the  $x$ -axis and the graph of the function  $y = \frac{4}{x^2} - 1$  from  $x = 1$  to  $x = 4$ .

Problem 4 (10 points): Find the average value of the function  $f(x) = \frac{2x}{x^2+1}$  over the interval  $[0, 1]$ .

Problem 5 (10 points): Let  $f(x) = 1000x$  be the rate of continuous money flow in dollars per year. Assume a 10-year period of interest rate 10% compounded continuously. Compute the following: (You can leave the natural base  $e$  in your final answers.)

(a) The total money flow.

(b) The present value of the money flow.