

May 21, 2002

Name (Please Print) \_\_\_\_\_

Math 125 B—Second Midterm Exam—Spring 2002

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Your T.A. \_\_\_\_\_ Your Signature \_\_\_\_\_

Quiz Section 

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Student I.D.# 

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This is a *limited open note* exam. You may use one page of notes that are *in your own handwriting*. You may *not* use books, printed matter, etc.

You may *not* use graphing or programmable calculators. You may use a “scientific calculator” (capable of doing trig functions, exponentials, and logarithms).

There are 5 problems. Each problem is worth 10 points, for a total of 50 points. Show all of your work. Partial credit will be given for partial solutions. Correct answers with insufficient or incorrect work will *not* get much credit.

**Please note:** Give all answers as EXACT answers (like  $\pi/6$  or  $1 + \sqrt{2}$ ) unless you are explicitly given directions otherwise.

**Score**

1.	(10)	
2.	(10)	
3.	(10)	
4.	(10)	
5.	(10)	
Total	(50)	
Exam Grade		

1. Find the average value of the function  $f(x) = \sin^{-1}(x)$  on the interval  $0 \leq x \leq 1$ .

2.(a) (5 points) Evaluate the definite integral  $\int_0^1 \frac{x^3}{x^2 + 1} dx$ .

(b) (5 points) Evaluate the improper integral  $\int_0^\infty x e^{-3x} dx$ .

3.(a) (5 points) Evaluate the indefinite integral  $\int \frac{1}{x^2 \sqrt{x^2 - 1}} dx$ .

(b) (5 points) What is the Trapezoid Rule approximation to the integral  $\int_2^5 \frac{1}{x^2 \sqrt{x^2 - 1}} dx$  with  $n = 3$  subintervals? Write out the correct sum and evaluate all the terms correctly, but DO NOT SIMPLIFY your answer any further.

4. Evaluate the indefinite integral  $\int \frac{4}{x^2(x+2)} dx$ .

5. The region in the  $xy$ -plane between the lines  $x = 2$  and  $x = 3$ , above the  $x$ -axis and below the graph of  $y = \sqrt{x}(4x - x^2)^{1/4}$ , is rotated around the  $x$ -axis.

(a) (3 points) Express the volume of the solid of revolution as a definite integral with respect to  $x$ . IN THIS PART, DO NOT EVALUATE THE INTEGRAL YET.

(b) (7 points) Evaluate the integral in part(a) to find the volume of the solid of revolution.