University of Washington **Department of Mathematics**

1st Midterm Exam **Math 125 B** **January 29, 2002**

Name _____

Student number _____ *Quiz section:* _____

Problem	Total Points	Score
1	9	
2	6	
3	9	
4	8	
5	7	
6	11	
Total	50	

Instructions

1. Print your name, student ID number and section number on this page. Do **NOT** separate the pages of the exam.
2. Print your name on each page of the exam as you check to see that your copy of the exam has 6 pages.
3. All work must be shown. Partial credit will be given except where otherwise indicated.
4. You may use a scientific calculator and one sheet (two-sided) of handwritten notes. Other notes, books or a graphing calculators are not allowed. If you need more space to solve a problem, use the back of the page preceding that problem.
5. Your answers should NOT be given as decimals, unless stated otherwise. For example, if the result is $\pi^2/4$, your answer should be $\pi^2/4$ and not 2.47. Simplify expressions as far as possible or reasonable.
6. Read each question carefully. Work the problems in an order that will maximize your score. Good Luck!

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1. Evaluate the following three integrals

(a) (3 pts)

$$\int x(x-2)^{1/3}dx$$

(b) (3 pts)

$$\int_0^2 x^2 e^{-x^3}dx$$

(c) (3 pts)

$$\int_0^2 \sqrt{4-x^2}dx$$

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2. (6 pts) For $F(x) = \int_{\sqrt{x}}^{1} \tan^{-1} u du$, find $F(1)$ and $F'(1)$.

3. (9 pts) Find the area of the region bounded by the parabola $y = x^2$, the tangent line to this parabola at the point (1,1), and the x-axis.

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4. (8 pts) An object is tossed into the air at time $t = 0$. At time t=1s the object has reached height 14.7m. Assuming that there is no air resistance, answer the following questions (recall that the gravitational constant is 9.8 m/s^2; give your answers in decimals).
   (a) What is the maximal height that the object reaches?

   (b) What is the total distance that the object flies from time 0 until time t=3?

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5. (7 pts) Use midpoints and $n = 5$ to approximate $\int_1^3 \sqrt{x}dx$. Give your answer in decimals.

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6. Consider the region between the curve $y = \sqrt{x-1}$, $x \geq 1$, the x-axis, and the vertical line $x = 5$.
   (a) (5 pts) Find the volume obtained from rotating the region about the x-axis

   (b) (3 pts)Set up an integral for the volume of the solid obtained by the rotating the region about the line $x = 3$. DO NOT EVALUATE THE INTEGRAL.

   (c) (3 pts)Set up an integral for the volume of the solid obtained by the rotating the region about the y-axis. DO NOT EVALUATE THE INTEGRAL.