Math 125 - Spring 2006
Exam 1
April 20, 2006

Name: _____

Section: _____

Student ID Number: _____

TA's Name: _____

1	10	
2	10	
3	9	
4	6	
5	5	
6	10	
Total	50	

- You are allowed to use a basic scientific calculator (NO graphing calculators)

- You may use one **hand-written** 8.5 by 11 inch page of notes. Put your name on your sheet of notes and turn it in with the exam.

- Check that your exam contains all the problems listed above.

- You must show your work on all problems. The correct answer with no supporting work may result in no credit.

- Box in your final answer.

- When appropriate, round your final answer to two decimal places after the decimal.

- Any student found engaging in academic misconduct will receive a score of 0 on this exam.

- You have 80 minutes to complete the exam.

GOOD LUCK!

1. Evaluate the following indefinite integrals.

   (a) (5 points) $\displaystyle\int \frac{\sin(4 + \ln(y))}{y}\, dy$

   (b) (5 points) $\displaystyle\int x^3\sqrt{18 - x^2}\, dx$

2. Evaluate the following definite integrals.

(a) (5 points) $\displaystyle\int_1^e \frac{\sqrt{x} + 3x}{x^2}\, dx$

(b) (5 points) $\displaystyle\int_0^{\frac{\pi}{2}} \cos(x)\,(\sin(x))^{1/3}\, dx$

3. A particle is moving on a straight line with acceleration given by $a(t) = -2t + 1$ and initial velocity $v(0) = 2$.

(a) (3 points) Find the velocity, $v(t)$, for the particle at time t.

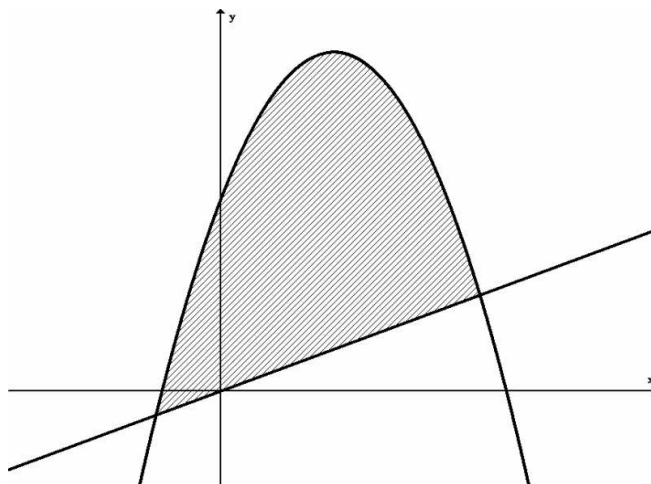(b) (3 points) Find the displacement of the particle from $t = 0$ to $t = 3$.

(c) (3 points) Find the total distance traveled by the particle from $t = 0$ to $t = 3$.

4. (6 points)

The graph to the right illustrates the region bounded by the the two curves

$$x = 2y \quad \text{and} \quad y = -x^2 + 3.5x + 4.$$

Find the area of this region.

5. (5 points) Use the midpoint rule with $n = 3$ rectangles to approximate the value of the integral:

$$\int_0^6 \sqrt{x^3 + 1}\,dx$$

6. Consider the region bounded by the curves $y = x^2$ and $y = 3x$ and answer the following.

(a) (5 points) Using the method of cylindrical shells, express the volume of the solid of revolution obtained when this region is rotated around the y-axis in terms of a definite integral.
DO NOT EVALUATE THE INTEGRAL.

(b) (5 points) Express the volume of the solid of revolution obtained when this region is rotated around the horizontal line $y = -2$ in terms of a definite integral.
DO NOT EVALUATE THE INTEGRAL.