Math 125, Section A, Spring 2012, Midterm I

April 19, 2012

Name⎯⎯⎯

TA/Section⎯⎯

Instructions.

- There are 4 questions. The exam is out of 40 points.

- You are allowed to use one page of notes written only on one side of the sheet in your own handwriting. **Hand in your notes with your exam paper.**

- You may use a calculator which does not graph and which is not programmable. Even if you have a calculator, give me exact answers. ($\frac{2\ln 3}{\pi}$ is exact, 0.7 is an approximation for the same number.)

- **Show your work**. If I cannot read or follow your work, I cannot grade it. You may not get full credit for a right answer if your answer is not justified by your work. If you continue at the back of a page, make a note for me. Please $\boxed{\text{BOX}}$ your final answer.

Question	points
1	
2	
3	
4	
Total	

1. Evaluate the following integrals.

(a) (4 points) $\displaystyle\int_0^3 \frac{t^2 + t - 1}{t + 2} \ dt$

(b) (3 points) $\displaystyle\int \frac{\arctan x}{x^2 + 1} \ dx$

(c) (3 points) $\displaystyle\int_0^1 7x^2 + e^x - \sin x \ dx$

2. Let

$$g(x) = \int_x^{x^2+1} \ln\left(t^3 + 1\right) dt$$

(a) (5 points) Compute $g'(2)$.

(b) (5 points) Approximate $g(2)$ with $n = 6$ and using left points. Is your approximations more than or less than the actual value of $g(2)$?

3. To find the area of the region which is bounded by $y = x^3$ on the right, $y = x$ on the left and the horizontal line $y = 0.5$ at the top,

   (a) (1 point) Sketch the region labelling all necessary intersection points.

   (b) (3 points) Set up integral(s) ending in dx to find the area.

   (c) (3 points) Set up integral(s) ending in dy to find the area.

   (d) (3 points) Evaluate your answer in part (b) or (c) to find the area. (Or do both to chech your work.)

4. (10 points) Find the volume of the solid obtained by rotating the region between $x = y^2 + 2$ and $x + y = 8$ about the y-axis.