Name: ______________________ **PID:** ______________

TA: ____________________ **Sec. No:** _____ **Sec. Time:** _____

Math 20B.
Midterm Exam 1
April 19, 2010

Turn off and put away your cell phone.
No calculators or any other devices are allowed on this exam.
You may use one page of notes, but no books or other assistance on this exam.
Read each question carefully, answer each question completely, and show all of your work.
Write your solutions clearly and legibly; no credit will be given for illegible solutions.
If any question is not clear, ask for clarification.

#	Points	Score
1	6	
2	6	
3	6	
4	8	
Σ	26	

1. Compute the following integrals

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

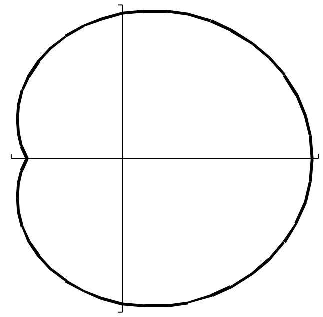
   (b) (3 points) $\displaystyle\int_0^2 \frac{x}{\sqrt{1+4x}}\,dx$

2. (6 points) Find the volume of the solid obtained by rotating about the x-axis the region enclosed by the curves

$$y = x^2 \quad \text{and} \quad y = 2x.$$

3. (6 points) Find the area enclosed by the polar curve

$$r = \cos\left(\frac{\theta}{2}\right) + 1, \quad -\pi \leq \theta \leq \pi.$$



4. (8 points) Let $\mathcal{R}$ be the region enclosed by the curves $y = x^2$ and $y = 4$.

(a) Find the area of the region $\mathcal{R}$.

(b) Find the number b such that the line $y = b$ divides the region $\mathcal{R}$ in part (a) into two regions with equal area. [Hint: Try integrating with respect to y rather than x.]