Print Your Name   Student ID #

Problem	Total Points	Score
1	15	
2	12	
3	11	
4	12	
Total	50	

Directions

- Please check that your exam contains a total of 5 pages.

- Show all your work or you may not receive credit.

- Place a box around your FINAL ANSWER to each question.

- This exam is closed book. You may use one 8.5×11 sheet of notes and a calculator.

- You may not share notes or calculators. You may not use a graphing calculator or any electronic device other than a calculator.

- If you use a trial and error (guess and check) or other numerical method when an algebraic method is available, you will not receive full credit.

- If you need more room, use the backs of the pages and indicate to the reader that you have done so.

- Raise your hand if you have a question.

Signature. Please sign below to indicate that you have not and will not give or receive any unauthorized assistance on this exam.
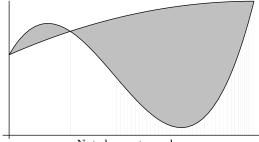
Signature: _____

1. (15 points) Do the following integration problems.

   (a) Evaluate $\displaystyle\int_1^3 (x-1)^{25}\,dx$.

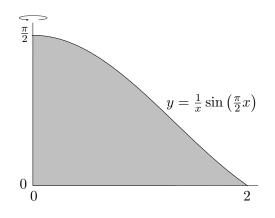   (b) Determine the general form of $\displaystyle\int t \sin t\, dt$.

   (c) Evaluate $\displaystyle\int_0^1 \frac{y}{e^y}\,dy$.

2. (12 points) Determine the total area of the region bounded by $y = 6x^3 - 31x^2 + 32x + 24$ and $y = -x^2 + 8x + 24$.

Not drawn to scale

3. (11 points) Let R be the region bounded by the equation $y = \frac{1}{x} \sin\left(\frac{\pi}{2}x\right)$, the x-axis, the y-axis, and $x = 2$, as shown below. Determine the volume of the solid formed by rotating R about the y-axis.

4. (12 points) The speed of a person in miles per hour is given by the formula

$$v(t) = \int_0^{\pi t} \left(1 - \frac{\sin^2 x}{x}\right) dx \,,$$

where t is the number of hours after 12:00 noon.

(a) What is the person's speed at 12:00 noon?

(b) What is the person's acceleration (in miles per hour per hour) at 12:30 p.m.?

(c) Use a Riemann sum with right endpoints and $n = 4$ subdivisions to calculate the person's speed at 2 p.m.