

Math 125
Midterm 1
April 27, 2006

Name: _____

1. Your exam contains 3 questions and 5 pages; Please make sure you have a complete exam.
2. The entire exam is worth 60 points. Point values for problems vary and these are clearly indicated. You have 50 minutes for this exam.
3. Make sure to **ALWAYS SHOW YOUR WORK**; you will not receive any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use the back page of the exam and clearly indicate this.
5. You are allowed one 8.5×11 sheet of handwritten notes (both sides). Graphing and scientific calculators are allowed.
6. Leave answers in exact form (as simplified as possible) or round to 4 decimal places.

Problem	Total Points	Score
1	15	
2	30	
3	15	
Total	60	

1. (15 pts.) Evaluate the following.

(a) (5 pts.) For $x > 0$, if $g(x) = \int_3^{\ln(x)} [t^2 + 4\sin(t)] dt$, what is $g'(x)$?

(b) (5 pts.) $\int \frac{x^2}{1+x^6} dx = ?$

(c) (5 pts.) $\int_{-\pi/2}^{\pi} [\cos(t) + \frac{3}{\pi}] dt$

2. (30 pts.) $f(x) = 3\sin(\frac{1}{2}x)$

(a) (7 pts.) Estimate the area of the region under the graph of f between $x = 0$ and $x = 2\pi$ using 4 approximating right-end rectangles.

(b) (5 pts.) Write the exact area under the graph of f between $x = 0$ and $x = 2\pi$ as a limit of a sum of approximating right-end rectangles. DO NOT EVALUATE THIS LIMIT.

(c) (8 pts.) Find the exact area under the graph of f between $x = 0$ and $x = 2\pi$ using integration.

(d) (10 pts.) What is the area between $f(x)$ and $g(x) = \sin(x)$ between $x = \pi$ and $x = 3\pi$?

3. (15 pts.) Let R be the region enclosed by the graphs of $y = e^x$, $y = e^2$, and the y -axis. Find the volume of the solid obtained by revolving the region R about the x -axis.