

Math 125 - Spring 2007
Exam 1
April 19, 2007

Name: _____

Section: _____

Student ID Number: _____

1	12	
2	10	
3	12	
4	12	
5	14	
Total	60	

- You are allowed to use a scientific calculator (**no graphing calculators**) and 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.
- If you need more room, use the backs of the pages and indicate to the grader that you have done so.
- Raise your hand if you have a question.
- Any student found engaging in academic misconduct will receive a score of 0 on this exam.
- You have 50 minutes to complete the exam.

GOOD LUCK!

1. (12 points)

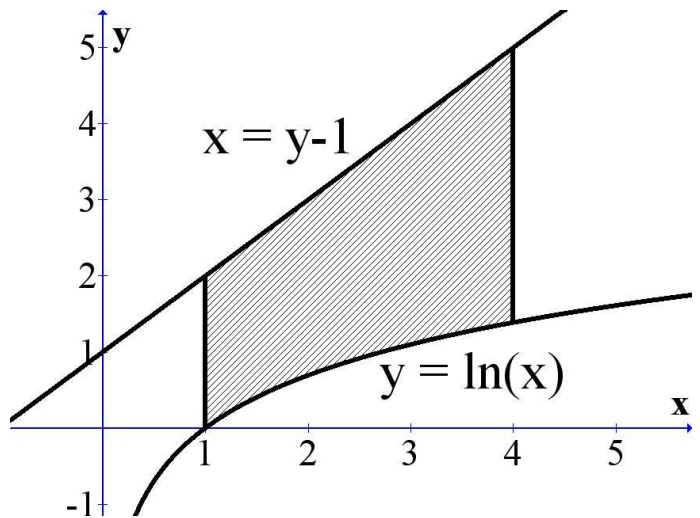
(a) Evaluate $\int_1^e \frac{\sqrt{\ln(x)}}{x} dx$

(b) If $g(x) = \int_0^{\ln(x)} \frac{e^t}{1+t} dt$ for $x \geq 1$, find $g'(e)$.

(c) Evaluate: $\int_0^3 |3x^2 - 12| dx$

2. (8 points)

Consider the region, R , bounded by the curves $y = \ln(x)$, $x = y - 1$, $x = 1$ and $x = 4$. A picture of this region is given at right.



(a) Set up an integral that represents the **area** of the region R .
(DO NOT EVALUATE THE INTEGRAL.)

(b) Approximate the **area** of this region using $n = 3$ approximating rectangles and right endpoints.

3. Evaluate the following integrals:

$$(a) \int \frac{(1+x)\sqrt{x}}{x} dx$$

$$(b) \int \frac{\sin(\sqrt[3]{x})}{x^{2/3}} + \cos(x) dx$$

$$(c) \int x^3(1+x^2)^{10} dx$$

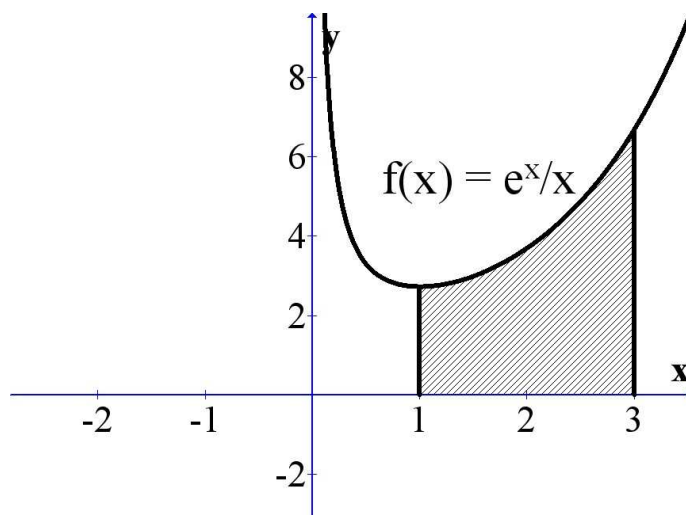
4. Suppose you look out the window of a skyscraper and see someone throw an apple downward. Your window is at a height of 370 feet. The apple passes your window after 3 seconds (from the time it was thrown). The velocity at 3 seconds is -100 feet per second. Assuming that the apple has a constant acceleration of -32 ft/sec^2 , answer the following questions.

(a) Give the formula for the position of the apple at time t seconds after being thrown.

(b) Find the velocity at which the apple was thrown and also the height from which it was thrown.

5. Consider the region R bounded by $f(x) = \frac{e^x}{x}$, $x = 1$, $x = 7$ and the x -axis. A picture of this region is given at the right.

Consider the region R bounded by $f(x) = \frac{e^x}{x}$, $x = 1$, $x = 7$ and the x -axis. A picture of this region is given at the right.



- (a) Set up an integral of the form $\int_a^b f(x)dx$ that represents the volume of the solid obtained by rotating the region, R , about the line $y = -2$.

- (b) Find the exact volume of the solid obtained by rotating the region, R , about the y -axis.