

MATH 1272
Midterm II
Professor Bramson
November 2, 2004

Name: _____

T.A.: _____

INSTRUCTIONS: There are 100 points possible on the exam. Do as many problems as you can. Answers must be in the boxes provided to be counted. Show your work in the space provided below each problem - outside the boxes. If you need extra space, state where the work is being done. Also, be sure to justify your answers. Page 6 is provided as scratch; be sure your exam has all 6 pages. **NO CALCULATORS** are permitted. **GOOD LUCK!**

1. (15 pts) What is the distance traveled along the path $x(t) = t^4 + \sin t$, $y(t) = t^7 + 1$ from $t = 1$ to $t = 4$? Write your answer as an integral. Show any general formulas you are using.

2. (10 pts) Compute $\int \frac{1}{\sec 3y - \tan 3y} dy$.

Point total for page:

3. (20 pts) (a) Find the general solution of $y' = e^{2x+y}$. (Write the answer as a function of x .) Show your work.

(b) What is the solution with $y(0) = 1$?

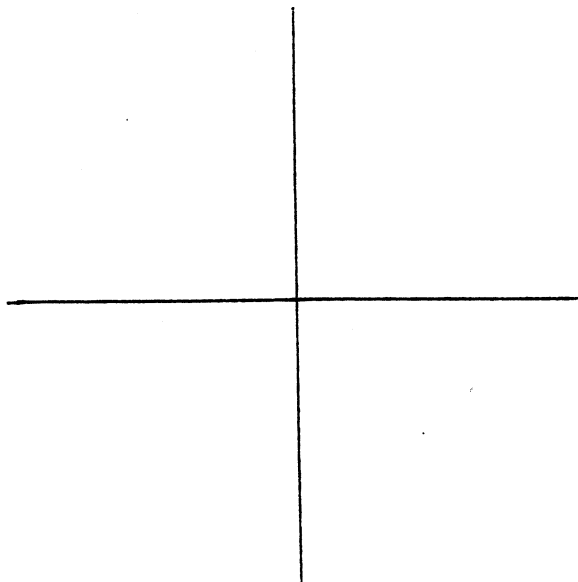
4. (15 pts) What is the centroid of the region lying between $f(x) = x^2 + 6x - 5$ and $g(x) = 2x^2$? You can write your answer in terms of integrals. Write down any formulas you are using.

Point total for page:

5. (15 pts) (a) Suppose you know that the rate at which the temperature of your turkey in the refrigerator changes (in hours) is $T' = 10 - \frac{1}{4}T$. If its temperature is initially 70 degrees, what will its temperature be in 3 hours?

(b) Approximately what will its temperature be in 2 days? Why?

6. (20 pts) Find the area of the region that lies inside $r = 3 \cos \theta$ and outside $r = 1 + \cos \theta$. Make a sketch of both curves on the graph provided below. Show any general formulas you are using.



Point total for page: