

Math 213 (Spring 2006)

Name: _____

Discussion

Mon 8:50

Mon 12:05

Mon 2:25

Wed 8:50

Exam 1

Thursday, February 16, 8:00

7 problems — 100 points — 70 minutes

Please write your NAME and circle your SECTION on top of this sheet.

Do not detach these sheets.

If you run out of space, use the back of the sheets.

Show ALL Work for Full Credit

NO GRAPHING CALCULATORS may be used on this exam

Problem 1 (10 points):

Problem 2 (15 points):

Problem 3 (15 points):

Problem 4 (15 points):

Problem 5 (15 points):

Problem 6 (15 points):

Problem 7 (15 points):

Total:

2

1. (10 points) Find the antiderivative of

$$f(x) = 3x^6 + 5^x + 4e^{-2x} - 1$$

2. (15 points) Find the antiderivative of

$$f(x) = \frac{x-2}{\sqrt{x^2-4x+5}} - x \ln x$$

4

3. (15 points) (a) Evaluate the definite integral

$$\int_0^1 (x+1)e^{3x} dx$$

(b) Estimate the integral using the trapezoid rule with $n = 2$.

4. (15 points) Compute the area of the region between the graphs of the functions $f(x) = e^x$ and $g(x) = e^{2x}$ from $x = -2$ to $x = 1$.

5. (15 points) (a) The velocity of a bus # 80 leaving a stop at time $t = 0$ was $v(t) = 5\sqrt{t}$ until time $t = T$ (time in seconds, speed in meters per second). Given the bus covered a distance of 90 meters during these T seconds, find T .

(b) What was the average speed of the bus between times $t = 0$ and $t = T$?

6. (15 points) Evaluate the improper integrals

$$\int_2^{\infty} (x^2 + 1)e^{-(x^3+3x)} dx$$

and

$$\int_{-\infty}^2 (x^2 + 1)e^{-(x^3+3x)} dx$$

8

7. (15 points) Find the volume of the solid of revolution formed by rotating the region, bounded by the curves $x = 0$, $y = 1$ and $y = \sqrt{x}$, about the x -axis.