

**Math 126**  
**Fall 1997**  
**Test 1**  
**Sept. 23, 1997**

- This test runs for one hour.
- All work is to be your own.
- Calculators are not to be used.

**Grading on this examination.**

The two multiple choice questions are either correct or wrong. Please write the letter of the correct answer in the box provided. The remaining questions will require you to demonstrate knowledge of a correct procedure for arriving at the answer. Please circle the answer you want us to consider. The correct answer is not enough for full credit, you must indicate how you arrived at it. Please mark out any work on a problem that you do not want us to consider.

Please write your name and your Lab. section # at the top of the next sheet. Write your name at the top of each subsequent sheet. If the name of your Professor is not the name at the top of the next page, raise your hand.

Your Section # choices are:

#	Room	Time	Instructor
01	184 Nieuwland	11:00 - 11:50	Jager
02	129 DeBartolo	12:55 - 1:45	Jager
03	184 Nieuwland	3:55 - 4:45	Vassiliev
04	140 DeBartolo	2:00 - 2:50	Jager
05	205 Cushing	2:00 - 2:50	Vassiliev
06	318 DeBartolo	9:30 - 10:20	Vassiliev

The Professor should be at the front of the room.

1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
Total: _____	

Name: \_\_\_\_\_

Professor: Wong

Lab. Section # \_\_\_\_\_

1. (5pt) Which formulae below is  $\frac{d(\ln u)}{dx}$  ?

(a)  $\frac{\ln u}{u}$

(b)  $\frac{1}{x}$

(c)  $\frac{1}{\frac{du}{dx}}$

(d)  $\frac{1}{u} \frac{du}{dx}$

(e)  $\frac{1}{x} \frac{du}{dx}$

2. (5pt) Which formulae below is  $\frac{d(\arcsin v)}{dt}$  ?

(a)  $\frac{v}{\sqrt{v^2 - 1}}$

(b)  $\frac{1}{\sqrt{1 - t^2}}$

(c)  $\frac{\frac{dv}{dt}}{v\sqrt{v^2 - 1}}$

(d)  $\frac{v \frac{dv}{dt}}{\sqrt{1 - v^2}}$

(e)  $\frac{\frac{dv}{dt}}{\sqrt{1 - v^2}}$

Name: \_\_\_\_\_

3. (20pt) An unknown element is found to be radioactive. By chemical analysis, it is found that 15% of a given sample is lost in a 24 hour period. What is the half-life of this element? (An answer such as  $t = \frac{\ln 97}{\ln 78.64}$  or  $\ln 84 + e^3$  is fine.)

Name: \_\_\_\_\_

4. (10pt) Evaluate  $\lim_{y \rightarrow 0} \frac{y^2}{\cos(3y) - 1} =$

Name: \_\_\_\_\_

5. (20pt) Evaluate

a)  $\int \frac{dv}{16 + 9v^2} =$

b)  $\int \frac{v dv}{16 + 9v^2} =$

Name: \_\_\_\_\_

6. (15pt) Find the unique function satisfying the two conditions  $\frac{dy}{dt} = 4y$  and  $y(1) = 3$ .

Name: \_\_\_\_\_

7. (10pt) Evaluate  $\int \frac{du}{\sqrt{4u - u^2 - 3}} =$

Name: \_\_\_\_\_

8. (15pt)  $\int_0^{\ln 5} \frac{dy}{\sqrt{e^{2y} - 1}} =$