

Math 125 D Winter 2012  
Mid-Term Exam Number Two  
February 23, 2012

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

Student ID no. : \_\_\_\_\_

Signature: \_\_\_\_\_

Section: \_\_\_\_\_

1	20	
2	20	
3	20	
4	10	
5	10	
6	5	
Total	85	

- Complete all questions.
- Show all work for full credit.
- You may use a scientific calculator during this examination. Graphing calculators are not allowed. Also, other electronic devices are not allowed, and should be turned off and put away for the duration of the exam.
- If you use a trial-and-error or guess-and-check method when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes. Write your name on your notesheet and turn it in with your exam.
- You have 80 minutes to complete the exam.

1. Evaluate the following integrals.

$$(a) \int \frac{1}{\sqrt{x}(x+3)} dx$$

$$(b) \int e^{2x} \cos 5x dx$$

2. Evaluate the following integrals.

(a)  $\int \sqrt{3 - 2x - x^2} dx$

(b)  $\int \sin^7 x \cos^5 x dx$

3. Evaluate the following integrals.

$$(a) \int \frac{x^2}{(x+2)(x+1)^2} dx$$

$$(b) \int_0^{\infty} \frac{1}{(x+1)(x+2)} dx$$

4. Let  $R$  be the region bounded by  $y = x^2$ ,  $y = x^3$ ,  $x = 0$ , and  $x = 1$ . Find the volume of the solid obtained by rotating  $R$  about the  $x$ -axis.

5. Let  $R$  be the region bounded by  $y = x(10 - x)$ ,  $x = 0$ ,  $x = 5$  and the  $x$ -axis. Find the volume of the solid obtained by rotating  $R$  about the line  $x = 7$ .

6. Use Simpson's Rule with  $n = 4$  to estimate the average value of  $f(x) = e^{1/x}$  on the interval  $1 \leq x \leq 13$ . Given your answer as a decimal value.