Math 150 B: Integration and Infinite Series

Spring 2012

Instructor	:	Maria R. D'Orsogna
Lectures	:	Mon-Tue-Thu 5:00 - 6:25pm in Chaparral 5124
Office hours	:	Mon and Thu 2-3 pm or by appointment in Santa Susana Hall 123
Contact	:	dorsogna@csun.edu or (818) 617 - 2703
Textbook	:	Calculus, 7th edition, Thompson, James Stewart, IBSN 9780538497817

Course description:

This course will introduce you to the integration of functions and to the summation of finite and infinite series. Essentially, integration is a special type of summation. Just like differentiation it is a fundamental mathematical tool used in every field of the quantitative sciences, from physics to biology to economics. It is often used as a way to calculate surface and volume areas. Summation series also arise in many real-life situations. You may have heard of the Persian chessboard legend where as a reward for inventing chess, one of the royal advisers asked the kind to donate a grain of wheat on the first square of the chessboard, twice that on the second square, twice the latter on the third square and so on, until each square was filled. The king hesitated because he thought it was too modest a reward, but when he started filling the chessboard with wheat he realized the reward was greater than all the wheat he had stored in his granaries. The king did not know this, but the calculation is simple:

$$\sum_{n=0}^{63} 2^n = 2^{64} - 1 = 18 \text{ quintillion!!} \tag{1}$$

Sums like these are routinely used in the applied sciences: here we will learn the fundamentals of series summation. We start by reviewing some fundamentals of differentiation

and learn how to work with special functions such as exponentials, logarithms and trigonometric functions. We will then concentrate on integration and series summation. It is very important to have mastered the material from Math150A. You are expected to work, and hopefully learn, a lot.

Evaluation:

Your grade will be based on three midterms (20 % of your grade) and a final cumulative exam (40 % of your grade). A grade of F will be given to those who do not show up for the final exam. No make-up exams will be given, except for extreme circumstances, so talk to me within the first two weeks of class if there are time conflicts. The midterms will be on February 23^{rd}, March 22^{nd} and April 19^{th}.

Homework:

Expect a lot of homework: math is like going to the gym, you will gain muscles only if you keep practicing and practicing. It would be great if you wanted to work out even more problems than what assigned to you, and just to become better. You will be asked to perform all your homework on a separate notebook which will be collected on the last day of class and used to determine borderline grades. Almost all test material will be taken straight from your homework, so if you are confident doing the homework, chances are you will perform well on the tests. Calculators are super-banned and not allowed in class. Copying is not allowed. Please write out clearly, as it will make everyone's life easier.

Approximate Class Schedule:

Week 1: Sections 7.1 - 7.3
Week 2: Sections 7.4 - 7.7
Week 3: Sections 7.8 - 8.2
Week 4: Sections 8.3 - 8.6
Week 5: Sections 8.7 - 9.1
Week 6: Sections 9.2 - 9.5
Week 7: Sections 10.1 - 10.3
Week 8 Sections 10.4 - 10.6
Week 9: Sections 11.3 - 11.5
Week 10: Sections 11.6 - 12.2
Week 11: Sections 12.3 -12.5
Week 12: Sections 12.6 - 12.7
Week 13: Sections 12.8 - 12.9
Week 14: Sections 12.10 - 12.11

The date of final exam cannot be changed by the instructor.It will be a common final held on Friday May 18^{th} 2012 from 9am to 11 am. The room will be announced later.