

MARK BOX		
PROBLEM	POINTS	
1	36	
2	6	
3	2	
4	8	
5	8	
6	8	
7	8	
8	8	
9	8	
10	8	
%	100	

NAME: _____

SSN: _____

please check the box of your section below

Section 003 (MW 9:05 pm)

or

Section 004 (MW 10:10 pm)

INSTRUCTIONS:

- (1) To receive credit you must:
 - (a) **work in a logical fashion, show all your work, indicate your reasoning;**
no credit will be given for an answer that *just appears*;
such explanations help with partial credit
 - (b) when applicable put your answer on/in the line/box provided
 - (c) if no such line/box is provided, then box your answer
- (2) The MARK BOX indicates the problems along with their points.
Check that your copy of the exam has all of the problems.
- (3) You may **not** use a calculator, books, personal notes.
- (4) During this exam, do not leave your seat. If you have a question, raise your hand. When you finish: turn your exam over, put your pencil down, and raise your hand.
- (5) This exam covers (from *Calculus* by Anton, Bivens, Davis 8th ed.):
Sections 10.1 – 10.6 .

Problem Inspiration:

- 1-3.** a course handout - you were warned
- 4-6.** homework from § 10.1
- 7.** homework from § 10.3
- 8-10.** homework from § 10.6

Solutions will be available on the course homepage later this afternoon.

4.

$$\lim_{n \rightarrow \infty} \frac{4n^3 + 6n^2 - 17n + 9}{-5n^3 + 7n^2 - 9n - 18} =$$

5.

$$\lim_{n \rightarrow \infty} \frac{7n^2 + 9}{-5n + 2} =$$

Hint: watch your plus and minus.

6.

$$\lim_{n \rightarrow \infty} \frac{\ln(n)}{n} =$$

Hint: L'Hopital

7. Geometric Series

7a. If $|r| < 1$, then

$$\sum_{n=0}^{\infty} r^n =$$

Notice (a polite hint for problem 7b), if $|r| < 1$, then

$$\sum_{n=0}^{\infty} r^n = 1 + r + r^2 + r^3 + r^4 + \dots$$

7b. Find the sum of the below series. (Note that the sum begins at $n = 10$ instead of $n = 0$.)

$$\sum_{n=10}^{\infty} \left(\frac{1}{3}\right)^{n-2} =$$

You only have to carry the algebra out as far as I indicated in class.

On problems 8 - 10, check the correct box and then indicate your reasoning below. A correctly checked box without appropriate explanation will receive no points.

8. $\sum_{n=1}^{\infty} (-1)^n \left(\frac{\pi}{e}\right)^n$

absolutely convergent

conditionally convergent

divergent

Hint: $\frac{\pi}{e} \approx \frac{3.14}{2.7} \approx 1.16$.

9. $\sum_{n=17}^{\infty} (-1)^n \frac{1}{n!}$
- absolutely convergent
- conditionally convergent
- divergent

10. $\sum_{n=2}^{\infty} (-1)^n \frac{n^2}{n^3 + 8}$

absolutely convergent

conditionally convergent

divergent

More space for problem 10