Math 162: Calculus IIA

Second Midterm Exam

November 15, 2007

NAME (please print legibly): _____

Your University ID Number: _____

Indicate your instructor with a check in the box:

Juan Ortiz-Navarro	MWF 9:00 - 9:50 AM	
Doug Ravenel	MWF 10:00 - 10:50 AM	

- **The presence of calculators, cell phones, iPods and other electronic devices at this exam is strictly forbidden.**
- **Show your work and justify your answers. You may not receive full credit for a correct answer if insufficient work is shown or insufficient justification is given.**
- **You are responsible for checking that this exam has all 8 pages.**

QUESTION	VALUE	SCORE
1	15	
2	15	
3	15	
4	15	
5	15	
6	15	
7	15	
TOTAL	105	

1. (15 points) Find the sum of the series:

$$\sum_{n=0}^{\infty} \frac{2}{3^n}$$

ANSWER: _____

2. (15 points) Find the sum of the following series.

$$\sum_{n=1}^{\infty} \frac{3}{n^2 + 2n}$$

Hint: Use partial fractions.

ANSWER: _____

3. (15 points)

Does the following series converge or diverge? Why?

$$\sum_{n=1}^{\infty} \frac{2n}{\ln(n+1)}$$

Justify your answer, making sure to name any convergence or divergence tests that you are using.

ANSWER: _____

4. (15 points)

Does the following series converge conditionally, converge absolutely or diverge? Why?

$$\sum_{n=1}^{\infty} \frac{(-1)^n}{n \ln n}$$

Justify your answer, making sure to name any convergence or divergence tests that you are using.

ANSWER: _____

5. (15 points) Find the radius and interval of convergence of the following power series:

$$\sum_{n=0}^{\infty}(-1)^n\frac{x^{2n}}{(2n)!}$$

ANSWER: _____

6. (15 points)

Does this series converge or diverge?

$$\sum_{n=1}^{\infty} \frac{2^n(n+1)}{n!}$$

Justify your answer, making sure to name any convergence or divergence tests that you are using.

ANSWER: _____

7. (15 points)

Find the limit of this sequence.

$$\lim_{n\to\infty} \frac{2n^2+1}{\sqrt{3n^4+1}}$$

ANSWER: _____