MATH 2153-006 MIDTERM-II (PRACTICE)
APRIL 7, 2009

All questions are worth ten points. The maximum possible total is 70. You have approximately an hour and 15 minutes for this exam. Calculators, cell phones, i-pods and other technological gizmos are not allowed!

Question	Marks
1	
2	
3	
4	
5	
6	
7	
Total	

Question 1. Determine whether the sequence

$$a_n = \frac{(\ln n)^2}{n}$$

converges or diverges. If it converges, find the limit.

Question 2. Determine whether the series

$$\sum_{n=1}^{\infty} \frac{e^n}{3^{n-1}}$$

converges or diverges. If it converges, find its sum.

Question 3. How many terms of the series

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

would you need to add to find its sum to within 0.01?

Question 4. Determine if the series

$$\sum_{n=1}^{\infty} \frac{n^2 - 5}{n^3 - n + 13}$$

converges or diverges.

Question 5. Determine if the series

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

is absolutely convergent, conditionally convergent, or divergent.

Question 6. Test the series

$$\sum_{n=1}^{\infty} \sin\left(1/n\right)$$

for convergence.

Question 7. Find the radius of convergence, and the interval of convergence of the power series

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