MATH 227: Calculus II

SAMPLE MIDTERM II

Spring 2009

NAME :

NOTE: There are 5 problems on this midterm (total of 6 pages). Use of calculators to check your work is permitted; however, in order to receive full credit for any problem, you must show work leading to your answer. You have 50 minutes to complete this test.

Problem	Possible points	Score
1	20	
2	20	
3	20	
4	20	
5	20	
Total	100	

Problem 1. (20pts) Determine whether the following sequences converge or diverge and in the case when of convergence, compute the limit.

(a) $a_n = \dfrac{1 - 5n^4}{n^4 + 8n^3}$

(b) $a_n = \ln\left(1 - \dfrac{2}{n}\right)^n$

Problem 2. (20pts) Determine whether the following series converges or diverges. To receive full credit, be sure to explain your reasoning.

$$\sum_{n=1}^{\infty} \left(\frac{3}{(\ln 2)^n} + \frac{5}{n^2} \right)$$

Problem 3. (20pts) Determine whether the following series converges or diverges. To receive full credit, be sure to explain your reasoning.

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

Problem 4. (20pts) Determine whether the following series converges or diverges. To receive full credit, be sure to explain your reasoning.

$$\sum_{n=1}^{\infty} \frac{\sqrt{n}}{n^2 - 2}$$

Problem 5. (20pts) Determine whether the following series converges or diverges. To receive full credit, be sure to explain your reasoning.

$$\sum_{n=1}^{\infty} \frac{n!}{n^n}$$