MATH 221, Calculus II
Professor Hrant Hakobyan
7:05-8:20 PM

Midterm Exam 3
April 7, 2015

Your Name: _____

Recitation Instructor: _____

Recitation Time:_____

Show all your work in the space provided under each problem. Please write and present your answer in an organized way. You may use your one sheet of notes but no books or calculators. The exam is worth 60 points. The chart below indicates how many points each problem is worth. You may use the last page for your calculations.

Problem	1	2	3	4	5	6	**Total:**
Points							
Out of	10	10	10	10	12	8	60

(1) Decide if the **sequence** is convergent or divergent. If it is convergent find its limit.

(1a) $\dfrac{\sqrt{n^3+2n}}{(3n+n^{1/4})\sqrt{n}}$

(1b) $\dfrac{n^2}{3^n}$

(2) Decide if the **series** is convergent or divergent. If it is convergent find the sum.

(2a) $$\sum_{n=4}^{\infty} \frac{1}{n(n+1)}$$

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

(3) Use any method you have learned to determine if a series is convergent or divergent. Indicate, which test you are using.

(3a) $$\sum_{n=2}^{\infty} \frac{1}{n \ln n}$$

(3b) $$\sum_{n=2}^{\infty} \frac{\sqrt{n}+5}{n^2-1}$$

(4) Determine (by any method you know) if the series converges absolutely, converges conditionally or diverges.

(4a) $$\sum_{n=2}^{\infty} \frac{(-1)^n}{\ln n}$$

(4b) $$\sum_{n=1}^{\infty} \frac{(-4)^n}{n!}$$

(5) Use the Ratio test to determine if the series converges, diverges or if it is inconclusive.

(5a) $$\sum_{n=1}^{\infty} \frac{10^n}{n!}$$

(5b) $$\sum_{n=1}^{\infty} \frac{n!}{n^n}$$

(6) Find the radius of convergence and the interval of convergence of the power series

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

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