MATH 221 EXAM 2

Tuesday July 22, 2014

Instructor's Name:_____ Name: _____
No books are allowed. Use the back page as a sketch paper. For full credit show your work in detail.

Total:58	♯ 1	♯ 2	♯ 3	♯ 4	♯ 5

1 (15 pts). Determine whether the series converges or diverges:

- a. $\sum_{n=0}^{\infty} \frac{1}{\sqrt{n^3+2n+1}}$

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

- c. $\sum_{n=0}^{\infty} \frac{1}{n^2-9}$

2 (8 pts). Determine whether the infinite sequence with general term a_n converges or diverges. If it converges, give the limit; if it diverges, show why.

- a. $a_n = \ln\left(\frac{8n+33}{2n-1}\right)$

- b. $a_n = \frac{3^{2n}}{n!}$

3 (10 pts). Determine convergence or divergence of the alternating series. If it converges, is it absolute or conditional?

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

- b. $\sum_{n=1}^{\infty} \frac{\cos n}{2^n}$

4 (15 pts).

- a. Verify the Maclauren series for $f(x) = \frac{1}{1-x}$ is $\sum_{n=0}^{\infty} x^n$ and it's interval of convergence.

- b. Using part a. find the Maclauren series for $f(x) = \frac{1}{3+4x}$ and it's interval of convergence.

- c. Using part a. find the Maclauren series for $f(x) = \ln(1 - x^2)$ and it's interval of convergence.

5 (10 pts). Determine whether the series converges or diverges. If it converges, to what does it converge?

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

- b. $\sum_{n=0}^{\infty} \frac{3(-2)^n - 5^n}{8^n}$