Name______________________________ Date_____________Period___________ Fav. War Hero_____________

BC Test: Chapter 9.1, Calculator Permitted

Do your fork on this page.

1. Determine if the sequence $\left\{\dfrac{100\ln^{10} n}{n}\right\}$ converges or diverges. Show your work.

2. Determine if the following series converge or diverge. Justify using the name the test and show any calculations used to make your determination.

(a) $\displaystyle\sum_{n=1}^{\infty}\sqrt{\frac{1+3n^2+n^3}{4n^3-5n+2}}$

(g) $\displaystyle\sum_{n=1}^{\infty}\frac{n^2}{5^n}$

(l) $\displaystyle\sum_{n=2}^{\infty}\frac{1}{\left(\ln\sqrt{n}\right)^n}$

(b) $\displaystyle\sum_{n=1}^{\infty}\frac{\pi}{\sqrt{n^5}}$

(h) $\displaystyle\sum_{n=0}^{\infty}\left(\frac{7}{2}\right)^{-n}$

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

(c) $\displaystyle\sum_{n=1}^{\infty}\frac{1}{\sqrt[3]{n^5+5}}$

(i) $\displaystyle\sum_{n=1}^{\infty}\frac{4}{n^3+1}$

(n) $\displaystyle\sum_{n=1}^{\infty}\left(\frac{5n^2}{7n^2-100n}\right)^n$

(d) $\sum_{n=1}^{\infty} \frac{5n^2 - 6n + 3}{n^3 - 7n + 8}$

(j) $\sum_{n=1}^{\infty} (\sec n\pi) n^{-2/3}$

(o) $\sum_{n=1}^{\infty} \frac{(-10)^n}{4^{2n+1}(n+1)}$

(e) $\sum_{n=1}^{\infty} \frac{3^n + 4}{2^n}$

(k) $\sum_{n=1}^{\infty} \frac{8n^3 - 6n^5}{12n^4 - 9n^6}$

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

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

3. Determine if the series $\sum_{n=5}^{\infty} \frac{(-1)^n}{\sqrt[5]{3n^7 + 4}}$ converges absolutely, converges conditionally, or diverges.

4. What is the sum of each of the following:

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

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

(c) $\sum_{n=1}^{\infty} \left(\frac{1}{n+1} - \frac{1}{n+4}\right)$

(d) $\sum_{n=3}^{\infty} \frac{3}{3n^2 - 12}$

5. Multiple Choice: Which of the following series converge?

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

II. $\sum_{n=1}^{\infty} \frac{1}{n}\left(\frac{3}{2}\right)^n$

III. $\sum_{n=2}^{\infty} \frac{1}{n \ln n}$

(A) I only (B) II only (C) III only (D) I and III only (E) I, II, and III

Free Response:

6. Consider the series $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{3^n}$

   (a) Show that the series is absolutely convergent.

   (b) Calculate S_4, then determine, for S_4, an interval in which the sum of the series resides. Round your answer to five decimal places.

   (c) Find the number of terms necessary to approximate the sum of the series with an error less than 0.0001