Convergent or Divergent Series

You have learned many ways to test a series for convergence or divergence. How do you decide which test should be used and is there only one correct test for each series?

This lab reviews the strategies used to determine if a series is absolutely convergent, conditionally convergent or divergent.

During lab time, in a group with two or three other students, discuss what test(s) should be used to determine convergence or divergence of each series. State your reason(s) for your choice and whether absolute convergence or conditional convergence can be determined. You will not have time to complete your test(s) for convergence (absolute or conditional) or divergence. Complete the lab on your own time.

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

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

3) $\sum_{n=1}^{\infty} \frac{(-100)^n}{n!}$

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

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

6) $\sum_{n=1}^{\infty} \left(\frac{e}{\pi}\right)^n$

7) $\sum_{n=1}^{\infty} \tan\left(\frac{1}{n}\right)$

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

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

10) $\sum_{n=1}^{\infty} \frac{\cos\left(\frac{n}{2}\right)}{n^2+4n}$

Math 112 F24 Lab 9 Exercises Name: _____Section: ____Score: ____

ON THIS PAPER, complete all the work required to determine whether each series (1-10) is *absolutely convergent*, *conditionally convergent* or *divergent*. Clearly state the name of the series or the test(s) you use. If you use a comparison test, be sure to state what is known about the series that is chosen for the comparison. A subset of these problems is graded.

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