



Convergent or Divergent Series

You have learned many ways to test a series for convergence or divergence. In fact, you may be thinking, you've learned too many ways! 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 in making these decisions.

In a group of three or four 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. DO NOT work these all the way through.

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

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

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

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

7)
$$\sum_{n=2}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}-1}$$

8)
$$\sum_{n=1}^{\infty} \frac{4 \cdot 5^n - 5 \cdot 4^n}{6^n}$$

9)
$$\sum_{n=1}^{\infty} \tan\left(\frac{1}{n}\right)$$

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

Lab 9: ON YOUR OWN PAPER, submit by: _____

Determine whether each series listed above is absolutely convergent, conditionally convergent or divergent. Number each problem clearly and state the name of the series or the test you used. 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 will be graded.