

# Spring 2009 Math 152/STEPS

## Series Practice

Fri, 03/Apr ©2009 Art Belmonte and Amy Austin

Determine whether the series is absolutely convergent, conditionally convergent, or divergent. Use any tests you wish that are applicable.

1.  $\sum_{n=1}^{\infty} \frac{1}{n+3^n}$
2.  $\sum_{n=1}^{\infty} (-1)^n \frac{n}{n+2}$
3.  $\sum_{n=1}^{\infty} (-1)^n \frac{n}{n^2+2}$
4.  $\sum_{n=1}^{\infty} \frac{n^2 2^{n-1}}{(-5)^n}$
5.  $\sum_{n=1}^{\infty} \frac{1}{2n+1}$
6.  $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$
7.  $\sum_{k=1}^{\infty} \frac{2^k k!}{(k+2)!}$
8.  $\sum_{k=1}^{\infty} k^2 e^{-k}$
9.  $\sum_{n=1}^{\infty} n^2 e^{-n^3}$
10.  $\sum_{n=2}^{\infty} \frac{(-1)^{n+1}}{n \ln n}$
11.  $\sum_{n=1}^{\infty} \sin n$
12.  $\sum_{n=1}^{\infty} \frac{3^n n^2}{n!}$
13.  $\sum_{n=1}^{\infty} \frac{\sin 2n}{1+2^n}$
14.  $\sum_{n=0}^{\infty} \frac{n!}{2 \cdot 5 \cdot 8 \cdots (3n+2)}$
15.  $\sum_{n=1}^{\infty} \frac{n^2+1}{n^3+1}$

16.  $\sum_{n=1}^{\infty} (-1)^n 2^{1/n}$
17.  $\sum_{n=2}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}-1}$
18.  $\sum_{n=1}^{\infty} (-1)^n \frac{\ln n}{\sqrt{n}}$
19.  $\sum_{k=1}^{\infty} \frac{k+5}{5^k}$
20.  $\sum_{n=1}^{\infty} \frac{\sqrt{n^2-1}}{n^3+2n^2+5}$
21.  $\sum_{n=1}^{\infty} \tan(1/n)$
22.  $\sum_{n=1}^{\infty} n \sin(1/n)$
23.  $\sum_{n=1}^{\infty} \frac{n!}{e^{n^2}}$
24.  $\sum_{n=1}^{\infty} \frac{n^2+1}{5^n}$
25.  $\sum_{k=1}^{\infty} \frac{k \ln k}{(k+1)^3}$
26.  $\sum_{n=1}^{\infty} \frac{e^{1/n}}{n^2}$
27.  $\sum_{j=1}^{\infty} (-1)^j \frac{\sqrt{j}}{j+5}$
28.  $\sum_{k=1}^{\infty} \frac{5^k}{3^k+4^k}$
29.  $\sum_{n=1}^{\infty} \frac{\sin(1/n)}{\sqrt{n}}$
30.  $\sum_{n=1}^{\infty} \frac{1}{n+n \cos^2 n}$