

# Spring 2008 Math 152/STEPS

## Series Practice

Mon, 31/Mar

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

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

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

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

6.  $\sum_{n=1}^{\infty} \frac{1}{2n+1}$

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

8.  $\sum_{k=1}^{\infty} \frac{2^k k!}{(k+2)!}$

9.  $\sum_{k=1}^{\infty} k^2 e^{-k}$

10.  $\sum_{n=1}^{\infty} n^2 e^{-n^3}$

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

12.  $\sum_{n=1}^{\infty} \sin n$

13.  $\sum_{n=1}^{\infty} \frac{3^n n^2}{n!}$

14.  $\sum_{n=1}^{\infty} \frac{\sin 2n}{1+2^n}$

15.  $\sum_{n=0}^{\infty} \frac{n!}{2 \cdot 5 \cdot 8 \cdots (3n+2)}$

16.  $\sum_{n=1}^{\infty} \frac{n^2+1}{n^3+1}$

17.  $\sum_{n=1}^{\infty} (-1)^n 2^{1/n}$

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

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

20.  $\sum_{k=1}^{\infty} \frac{k+5}{5^k}$

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

22.  $\sum_{n=1}^{\infty} \frac{\sqrt{n^2-1}}{n^3+2n^2+5}$

23.  $\sum_{n=1}^{\infty} \tan(1/n)$

24.  $\sum_{n=1}^{\infty} n \sin(1/n)$

25.  $\sum_{n=1}^{\infty} \frac{n!}{e^{n^2}}$

26.  $\sum_{n=1}^{\infty} \frac{n^2+1}{5^n}$

27.  $\sum_{k=1}^{\infty} \frac{k \ln k}{(k+1)^3}$

28.  $\sum_{n=1}^{\infty} \frac{e^{1/n}}{n^2}$

29.  $\sum_{n=1}^{\infty} \frac{(-1)^n}{\cosh n}$

30.  $\sum_{j=1}^{\infty} (-1)^j \frac{\sqrt{j}}{j+5}$

31.  $\sum_{k=1}^{\infty} \frac{5^k}{3^k+4^k}$

$$32. \sum_{n=1}^{\infty} \frac{(n!)^n}{n^{4n}}$$

$$33. \sum_{n=1}^{\infty} \frac{\sin(1/n)}{\sqrt{n}}$$

$$34. \sum_{n=1}^{\infty} \frac{1}{n + n \cos^2 n}$$

$$35. \sum_{n=1}^{\infty} \left( \frac{n}{n+1} \right)^{n^2}$$

$$36. \sum_{n=2}^{\infty} \frac{1}{(\ln n)^{\ln n}}$$

$$37. \sum_{n=1}^{\infty} \left( \sqrt[n]{2} - 1 \right)^n$$

$$38. \sum_{n=1}^{\infty} \left( \sqrt[n]{2} - 1 \right)$$