SKILLS CHECK 3
MATH 202 and MATH 202 Honors

This is a take home assignment. You may use your textbook and instructor to aid you in determining whether the following infinite series converge or diverge in Exercises 1-13 and to do the computations in Exercises 14 and 15. You may use a calculating device on Exercises 14 and 15; any other help is expressly forbidden. The assignment is due on Friday, March 29 at 3:30 p.m. in Bancroft 158. **You must show your work to get credit. Please take care to make your work legible. Use a separate side of a piece of paper for each exercise**.

1. $\displaystyle\sum_{k=1}^{\infty} \frac{k\sqrt{k}}{k^3+1}$
2. $\displaystyle\sum_{k=1}^{\infty} \sin k$
3. $\displaystyle\sum_{k=1}^{\infty} \frac{2^k}{3^{2k+1}}$
4. $\displaystyle\sum_{k=1}^{\infty} \frac{k^3}{4^k}$
5. $\displaystyle\sum_{k=2}^{\infty} \frac{(-1)^k}{(\ln k)^3}$
6. $\displaystyle\sum_{k=1}^{\infty} \frac{\cos^2(1/k)}{k^2}$
7. $\displaystyle\sum_{k=1}^{\infty} k^{-2.4}$
8. $\displaystyle\sum_{k=1}^{\infty} \left(\frac{2k^2+1}{3k^2-1}\right)^k$
9. $\displaystyle\sum_{k=1}^{\infty} \frac{(-1)^{k+1}k}{(k+1)(k+2)}$
10. $\displaystyle\sum_{k=2}^{\infty} \frac{2}{k(\ln k)^2}$
11. $\displaystyle\sum_{k=1}^{\infty} \frac{k^3}{\sqrt{k^7-k^4+3}}$
12. $\displaystyle\sum_{k=1}^{\infty} \frac{3^k}{(2k-1)!}$
13. $\displaystyle\sum_{k=1}^{\infty} \frac{\sin k}{k^3}$

14. Consider the convergent series

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

Find the upper and lower bounds for the sum of the series s if s_3 is used to approximate s.

15. Consider the convergent series

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n3^n}.$$

Approximate the sum of this series with an error less than 0.0005.