1. If you know that $\sum_{n=1}^{\infty} a_n$ converges to A and $\sum_{n=1}^{\infty} b_n$ converges to B, what can you deduce about

   (a) $\sum_{n=1}^{\infty} 2a_n - b_n$

   (b) $\sum \sqrt{a_n}$

   (c) $\sum_{n=1}^{\infty} (a_n)^2$

   (d) $\sum_{n=1}^{\infty} (-1)^n a_n$. Is the converse true?

2. Find the value of c so that $\sum_{n=1}^{\infty} \left(\frac{1}{n} + \frac{c}{n+1} \right)$ would converge. Discuss.

3. Find the sum of the series: $\sum_{n=0}^{\infty} \frac{2^n - 1}{10^n}$

4. Determine if the series below converge or diverge.

(a) $\sum_{n=2}^{\infty} \frac{1}{n^{0.9} \ln n}$

(b) $\sum_{n=2}^{\infty} \frac{1}{n (\ln n)^{0.9}}$

(c) $\sum_{n=1}^{\infty} \frac{(0.8)^n}{n!}$

(d) $\displaystyle\sum_{n=2}^{\infty} \frac{\cos(1/n)}{n^2}$

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

(f) $\displaystyle\sum_{n=1}^{\infty} \frac{8 - \ln n}{4 + 9n \ln(\ln n)}$

5. Determine if the alternating series below converge absolutely, conditionally or diverge.

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

(b) $\displaystyle\sum_{n=1}^{\infty} (-1)^n \sqrt[n]{e^{-2}}$

(c) $\sum_{n=1}^{\infty}(-6)^{-n}$

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

6. If we approximate$\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n}$ .. as $1-1/2+1/3-1/4+1/5$,what is a good estimation for the error involved?

7. For what values of x does the following series converge?

(a) $\sum \dfrac{(x-2)^n}{n(\ln n)^5}$