Math 111-002
Assignment # 11

Please remember that the assignment consists of only a sample of the kind of questions you are supposed to be able to do. It is **not** a safe practice to just do the assignment, and that is why there is a list of "suggested practice problems" in the course web page.

1. Determine if the series is convergent or divergent.

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{\sqrt{n}+3}{n^2}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{n^3}{n^4-2}$

   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}n^3}{n^4-2}$

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

   (e) $\displaystyle\sum_{n=1}^{\infty} \frac{5^n+n}{8^n-n^3}$

   (f) $\displaystyle\sum_{n=1}^{\infty} \frac{8^n+n}{5^n-n^3}$

   (g) $\displaystyle\sum_{n=1}^{\infty} n^{-n}$

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

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

   (j) $\displaystyle\sum_{n=1}^{\infty} (-1)^n(\sqrt{n+1}+\sqrt{n})$

   (k) $\displaystyle\sum_{n=1}^{\infty} (-1)^n(\sqrt{n+1}-\sqrt{n})$

2. Estimate $\displaystyle\sum_{n=1}^{\infty} \frac{2}{(4n+2)^5}$ with six correct decimals.

3. Estimate $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^2\,2^n}$ with three correct decimals.

4. Find the values of p for which the series is convergent.

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n(\ln n)^p}$

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

   (c) $\displaystyle\sum_{n=3}^{\infty} \frac{\ln n}{n^p}$

   (d) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n^p}$