Math 136: Calculus 2
Spring 2017
Professor Levandosky
Written Homework 9

1. Use the limit comparison test to determine whether each series converges or diverges.

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{3n^3+1}{n^4+7n^2+6}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{3^n+4^n}{2^n+5^n}$

2. Determine whether each alternating series converges or diverges.

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n-1}2n}{3n+5}$

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

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

3. Use the alternating series error bound to determine how large N must be in order for S_N to approximate the the sum of the series $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{(2n)!}$ to within 0.000001. Compute S_N for this N.

4. Use the ratio test to determine whether each series converges or diverges.

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

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{3^n+4^n}{2^n+5^n}$

   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{(n!)^3 5^{2n}}{(3n)!}$