MAT 301
Assignment 3

Friday September 14, 2012

For full credit on these problems, each must be submitted with a complete and clear solution, showing all of your work. You may work with other classmates on these problems, but please indicate on your assignment if you received help. Partial answers and incomplete solutions may be eligible for some partial credit, depending on the level of completeness and demonstrated understanding.

1. Determine whether the series converges conditionally or absolutely, or diverges.

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

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

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

2. Use the Ratio Test or the Root Test to determine the convergence or divergence of the series.

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

   (b) $\sum_{n=1}^{\infty} \left(\frac{n}{365}\right)^n$

   (c) $1 + \frac{1\cdot 2}{1\cdot 3} + \frac{1\cdot 2\cdot 3}{1\cdot 3\cdot 5} + \frac{1\cdot 2\cdot 3\cdot 4}{1\cdot 3\cdot 5\cdot 7} + \cdots$

3. Find the fourth Taylor Polynomial $P_4(x)$ for $f(x) = \sqrt{x}$, centered at $c = 1$.

4. Determine the values of x for which the series

$$\sum_{n=0}^{\infty} \left(\frac{x+1}{4}\right)^n$$

   converges.