The University of Waikato
Department of Mathematics

Elements of Analysis math252-08B 2008 Assignment 2

Due Friday 8th August: Please hand back your completed assignment through the slot for this paper outside the Mathematics Office G3.19.

It should be written up neatly and on no more than four sides of an A4 page or the equivalent.

1. Sum the following series to 3 terms, to n terms and to infinity by finding the limit of the sequence of partial sums:

$$\sum_{n=1}^{\infty}(\frac{1}{n(n+1)}+\frac{2}{5^n}).$$

2. Test the following series for divergence, by taking the limit of the n'th term as $n \to \infty$:

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

3. Test the following series for convergence or divergence, using D'Alembert's limit ratio test:

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

4. Test the following series for convergence or divergence, using the integral test (or a "$1/n^2$" series) and comparison test:

$$\sum_{n=1}^{\infty}\frac{10n+1}{(n(n+1)(n+2)}.$$

Kevin Broughan
30th July 2008