MATH 141, FALL 2009, REVIEW for MIDTERM III

1) [No partial credit.] Find the limit

$$\lim_{n\to\infty} \sqrt[n]{n^2}.$$

2) Find the sum of the series

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

3) Determine whether the series converges or diverges

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

4) Find the interval of convergence of the series

$$\sum_{n=1}^{\infty} \frac{2^{n+1}}{n3^n} x^n.$$

5) Find the Taylor series expansion of $f(x) = x/(x+1)$ around $x = 0$.