Numerical series
Mathematics A2
1st week

1. Converges or diverges? Give reason for your answer.

a.) $\sum_{n=1}^{\infty}\left(\frac{n^2}{n^2+1}\right)^{n^2}$ b.) $\sum_{n=1}^{\infty}\frac{\ln n}{n}$ c.) $\sum_{n=1}^{\infty}\frac{1}{n^2-2n+5}$ d.) $\sum_{n=1}^{\infty}\frac{2n}{n^2+1}$

2. Give the sum of the series (if it exists):

a.) $\sum_{n=3}^{\infty}\frac{3}{n^2-n-2}$ b.) $\sum_{n=1}^{\infty}\frac{e^{2n}-e^n}{e^{3n}}$

3. Converges absolutely, converges conditionally or diverges? Give reason for your answer.

a.) $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n\cdot 2^n}{3^n}$ b.) $\sum_{n=1}^{\infty}(-1)^n\frac{1}{2n+6}$ c.) $\sum_{n=1}^{\infty}(-1)^n\left(\sqrt{n^2+2n}-n\right)$