Homework #6 Problems
MATH 4433 Introduction to Analysis

1. Use the definition of a convergent series (the limit of the sequence of partial sums exists) to prove that $\sum_{j=1}^{\infty} \frac{1}{j(j+1)}$ converges, and find its sum. Hint: You can write $\frac{1}{j(j+1)} = \frac{1}{j} - \frac{1}{j+1}$ This will help you evaluate the partial sums. (This is called a telescoping sum.)

2. Show that the series $\sum_{j=2}^{\infty} \frac{1}{j^2-1}$ can also be written as a telescoping sum. Show that it converges and find its sum.