Assignment #10 **Name** _____

Due 13 April 2015

1. In each case determine whether or not the series converges absolutely, converges conditionally, or diverges.

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

   (b) $S = \sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n^{1/3}}$

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

(d) $S = \displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{n!}{5^n}$

(e) $S = \displaystyle\sum_{n=1}^{\infty} \left(\frac{n+1}{n^2+4} \right)^n$

(f) $S = \dfrac{(1)(1)}{(1\cdot 2)} + \dfrac{(1\cdot 2)(1\cdot 2)}{(1\cdot 2\cdot 3\cdot 4)} + \dfrac{(1\cdot 2\cdot 3)(1\cdot 2\cdot 3)}{(1\cdot 2\cdot 3\cdot 4\cdot 5\cdot 6)} + \dfrac{(1\cdot 2\cdot 3\cdot 4)(1\cdot 2\cdot 3\cdot 4)}{(1\cdot 2\cdot 3\cdot 4\cdot 5\cdot 6\cdot 7\cdot 8)} + \cdots$
(Hint: First find a simple expression for the nth term of the this series.)