

In class assignment 7 - More Series and Convergence Testing

Name: _____

November 3, 2014

Directions: Work in groups to complete the following problems.

1. Do the following series converge or diverge? Justify your answer.

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

(b) $\sum_{n=1}^{\infty} \frac{(2n)!}{n!(n+1)!}$

(c) $\sum_{n=1}^{\infty} \frac{1}{r^n n!}, r > 0$

(d) $\sum_{n=1}^{\infty} \frac{(-1)^n - 1}{\sqrt{n}}$

(e) $\sum_{n=1}^{\infty} \frac{(-1)^n}{e^n}$

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

(g) $\sum_{k=1}^{\infty} \frac{2^{k-1} 3^{k+1}}{k^k}$

(h) $\sum_{n=1}^{\infty} \frac{(-1)^n}{\cosh(n)}$

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

(j) $\sum_{n=1}^{\infty} \frac{e^{\frac{1}{n}}}{n^2}$

(k) $\sum_{n=1}^{\infty} \frac{1}{2\sqrt{n} + \sqrt{n+2}}$

2. Determine whether the series are absolutely convergent, conditionally convergent, or divergent

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

(b) $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{(2n)!}$

3. Find the partial sum s_n of $\sum_{n=1}^{\infty} \ln\left(\frac{n+1}{n}\right)$. Does this series diverge or converge?

4. Find the values of p where $\sum_{n=1}^{\infty} \frac{\ln(n)}{n^p}$ is convergent.