Practice for 11.3 – 11.4 ***Name:***

1. Determine whether the series is convergent or divergent.

a) $\sum_{n=2}^{\infty} \frac{\ln n}{n}$

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

c) $\sum_{n=3}^{\infty} \frac{1}{n \ln n \sqrt{\ln^2 n - 1}}$

d) $\sum_{n=3}^{\infty} \frac{1}{n \ln n \ln\left(\ln n\right)}$

e) $\sum_{n=1}^{\infty} \frac{5 - 2\sqrt{n}}{n^3}$

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

2. Find the values of p for which the series is convergent.

a) $\sum_{n=3}^{\infty} \frac{1}{n \ln n [\ln(\ln n)]^p}$

b) $\sum_{n=1}^{\infty} \frac{\ln n}{n^p}$

3. Find the sum of the series $\sum_{n=1}^{\infty} \frac{1}{n^5}$ correct to three decimal places:

4. How many terms of the series $\sum_{n=2}^{\infty} \left[\frac{1}{n(\ln n)^2}\right]$ would you need to add to find its sum to within 0.01?

5. Determine whether the series is convergent or divergent.

a) $\sum_{n=1}^{\infty} \frac{1}{2\sqrt{n} + \sqrt[3]{n}}$

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

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

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

e) $\sum_{n=1}^{\infty} \frac{5n-1}{2n^3 + 2n + 5}$

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

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

h) $\sum_{n=5}^{\infty}\frac{3n+1}{5n^{3}-7n^{2}+1}$

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i) $\sum_{n=1}^{\infty}\frac{(\ln n)^{2}}{n^{3}}$

j) $\sum_{n=2}^{\infty}\frac{1}{\sqrt{n}\ln n}$

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

l) $\sum_{n=1}^{\infty}\frac{1}{1+\ln n}$

6. Use the sum of the first 10 terms to approximate the sum of the series. Estimate the error.

a) $\sum_{n=1}^{\infty} \frac{1}{n^4 + n^2}$

$\sum_{n=1}^{\infty} \frac{n}{(n+1)3^n}$

7. For what values of a, if any, do the following series converge?

a) $\sum_{n=1}^{\infty} \left(\frac{a}{n+2} - \frac{1}{n+4} \right)$

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