1. Find the **SUM** of the following series or show that it diverges.

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

(b). $\sum_{n=0}^{\infty}\frac{3^{n-1}}{5^{n+2}}$

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

(d). $\sum_{n=1}^{\infty}\frac{3^{2n}}{4^n}$

2. Given $\sum_{n=1}^{\infty}\frac{4}{n^3}$

(a). Find the 3rd partial sum s_3.

(b). If s_3 is used to approximate the infinite series, what is the bound for the maximum possible error? (i.e. bound on $|R_3|$?)

(c). How many terms are needed for error to be less than 0.001.

3. Determine whether the following **series** converge or diverge. Show all your work and clearly indicate any tests that you use.

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

(b). $\sum_{n=1}^{\infty}\frac{5\sqrt{n}+1}{3+2n^2}$

(c). $\sum_{n=1}^{\infty}\frac{\ln n}{n}$

(d). $\sum_{n=1}^{\infty}\frac{(n!)^2 3^n}{(2n)!}$

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

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

[More practice can be found in Section 11.7 and the Chapter 11 Review.]

4. Does $\sum_{n=2}^{\infty}(-1)^{n-1}\frac{1}{\ln n}$ converge absolutely, converge conditionally, or diverge.

5. Given $\sum_{n=0}^{\infty}(-1)^n\frac{1}{n+4}$

(a). Find the 5th partial sum s_5.

(b). If s_5 is used to approximate the infinite series, what is the bound for the maximum possible error? (i.e. bound on $|R_5|$?)

(c). How many terms are needed for error to be less than 0.001.

6. Find the interval and radius of convergence for the following series.

(a). $\sum_{n=1}^{\infty}\frac{3^n x^n}{n^n}$ **(b).** $\sum_{n=1}^{\infty}\frac{(-1)^n(x+2)^n}{n}$ **(c).** $\sum_{n=1}^{\infty}\frac{(2x+4)^n}{n4^n}$

7. Find the radius of convergence for the following series.

(a). $\sum_{n=0}^{\infty}\frac{(3x-2)^n}{n}$ **(b).** $\sum_{n=0}^{\infty}\frac{n^n x^n}{n!}$

8. Use a known power series to find a power series representation for the $f(x)=\frac{1}{1+3x^2}$.