Homework #14

Goal: Exploring Convergence of Infinite Series. Focus on Absolute and Conditional Convergence...also using the Absolute Convergence Test. Finally... some review problems.

Determine whether the given series if Absolutely Convergent, Conditionally Convergent or Divergent.

1. $\displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{n^3 + 8}{n^8 + 3}$

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

3. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n (\ln n) (2n)!}{n^n \, 2^{3n} (n!)}$

4. $\displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{n+1}{n^2}$

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

6. Write the statement of the Absolute Convergence Test.

7. Use the Absolute Convergent Test to show that $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n^3 + 1}$ Converges.

8. Use the Absolute Convergent Test to show that $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \sin^2 n}{n^8 + 2}$ Converges.

Review

9. Show that the Sequence $\left\{ \left(\dfrac{n}{n+1} \right)^n \right\}_{n=1}^{\infty}$ Converges to $\dfrac{1}{e}$.

10. Determine if the Series $\displaystyle\sum_{n=1}^{\infty} \left(\frac{n}{n+1} \right)^n$ Converges or Diverges.

11. Find the Sum of the series $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \, 5^{2n+1}}{2^{5n-1}}$.

REGULAR OFFICE HOURS

Monday: 1:00–3:00 pm

9–10:30 pm TA Mia, SMUDD 207

Tuesday: 12:00–4:00 pm

6–7:30 pm TA Ian, SMUDD 207

7:30–9:00 pm TA Karime, SMUDD 207

Wednesday: 1:00-3:00 pm

6–7:30 pm TA Ian, SMUDD 207

7:30–9:00 pm TA Daksha, SMUDD 207

Thursday: none for Professor

1–2:30 pm TA Mia, SMUDD 207

7:30–9:00 pm TA Daksha, SMUDD 207

Friday: 12:00–2:00 pm

2:30–4:00 pm TA Karime, SMUDD 014**

This is the end of the material for the Exam 2. Material stops after
Section 11.6 Absolute Convergence Test and Ratio Test
and Absolute/Conditional Convergence.