Math 1497 − Calculus II Spring 2022 − Homework 6

pg. 620, #7, 9, 11, and 15.

Use the direct comparison test to determine the convergence of the following series

$$7. \quad \sum_{n=2}^{\infty} \frac{1}{\sqrt{n}-1} \qquad\qquad 9. \quad \sum_{n=2}^{\infty} \frac{\ln n}{n+1}$$

$$11. \quad \sum_{n=0}^{\infty} \frac{1}{n!} \qquad\qquad 15. \quad \sum_{n=1}^{\infty} \frac{\sin^2 n}{n^3}$$

pg. 637, #23, 25, 32, and 35.

Use the ratio test to determine the convergence of the following series

$$23. \quad \sum_{n=1}^{\infty} \frac{9^n}{n^5} \qquad\qquad 25. \quad \sum_{n=1}^{\infty} \frac{n^3}{3^n}$$

$$32. \quad \sum_{n=1}^{\infty} \frac{n!}{n^n} \qquad\qquad 35. \quad \sum_{n=0}^{\infty} \frac{5^n}{2^n+1}$$

pg. 638, #39, 41, 47, and 49.

Use the root test to determine the convergence of the following series

$$39. \quad \sum_{n=1}^{\infty} \left(\frac{n}{2n+1} \right)^n \qquad\qquad 41. \quad \sum_{n=1}^{\infty} \left(\frac{3n+2}{n+3} \right)^n$$

$$47. \quad \sum_{n=1}^{\infty} \frac{n}{3^n} \qquad\qquad 49. \quad \sum_{n=1}^{\infty} \left(\frac{1}{n} - \frac{1}{n^2} \right)^n$$

pg. 629, #9, 11, 13, and 27.

Determine the convergence of the following series

$$9. \quad \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n+1} \qquad\qquad 11. \quad \sum_{n=1}^{\infty} \frac{(-1)^n}{3^n}$$

$$13. \quad \sum_{n=1}^{\infty} \frac{(-1)^n(5n-1)}{4n+1} \qquad\qquad 27. \quad \sum_{n=1}^{\infty} \frac{(-1)^{n+1}n!}{1 \cdot 3 \cdot 5 \cdots (2n-1)}$$

Due: Friday Mar. 4, 2022 by 4pm.