

Math 1497 – Calculus II Spring 2024 – Homework 4

Week 5: Feb. 12-16, 2024

pg. 596, #5, 31, and 37.

Determine whether the following sequences converge or diverge. If it converges, find the limit.

$$5. a_n = \frac{5}{n+2} \quad 31. a_n = (-1)^n \frac{n}{n+1} \quad 37. a_n = \frac{(n+1)!}{n!} \quad 41. a_n = 2^{1/n}$$

pg. 597, #53 and 57.

Determine whether the following sequences are increasing or decreasing and if they are bounded?

$$53. a_n = 4 - \frac{1}{n} \quad 57. a_n = \left(\frac{2}{3}\right)^n$$

pg. 605, #5, 6, and 7.

Find the partial sums S_1, S_2, S_3, S_4 and S_5 of the following

$$\begin{aligned} 5. & 1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \dots \\ 6. & \frac{1}{2 \cdot 3} + \frac{2}{3 \cdot 4} + \frac{3}{4 \cdot 5} + \frac{4}{5 \cdot 6} + \dots \\ 7. & 3 - \frac{9}{2} + \frac{27}{4} - \frac{81}{8} + \frac{243}{16} - \dots \end{aligned}$$

pg. 605, #11, 12, 19 and 20.

Do the following convergence or diverge? If they converge, find the sum.

$$11. \sum_{n=0}^{\infty} 5 \left(\frac{5}{2}\right)^n \quad 12. \sum_{n=0}^{\infty} 4(-1.06)^n \quad 19. \sum_{n=0}^{\infty} 5 \left(\frac{5}{6}\right)^n \quad 20. \sum_{n=1}^{\infty} 2 \left(-\frac{1}{2}\right)^n$$

pg. 605, #31, and 32. Find the sum of the following

$$31. \sum_{n=1}^{\infty} \frac{4}{n(n+2)} \quad 32. \sum_{n=1}^{\infty} \frac{1}{(2n+1)(2n+3)}$$

pg. 605, #46, 47, 48 and 51. Do the following converge or diverge?

$$46. \sum_{n=0}^{\infty} \frac{6^n}{n+1} \quad 47. \sum_{n=1}^{\infty} \frac{n+1}{2n-1} \quad 48. \sum_{n=1}^{\infty} \frac{4n+3}{3n-1} \quad 51. \sum_{n=1}^{\infty} \frac{3^n}{n^3}$$

Due: Friday Feb. 16, 2024 by 3pm.