

WRITTEN ASSIGNMENTS FOR MATH 162

HW D (due Friday, 16th March)

1. For each of the following series determine if the series converges absolutely, converges conditionally, or diverges. Justify each answer.

(A)

$$\sum_{n=0}^{\infty} \frac{(-1)^n \sqrt{n^2 + 1}}{n^2 + n + 8}$$

(B)

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

2. Evaluate $\int \frac{x^{2017}(2018+2019x)}{1+x^{4036}+2x^{4037}+x^{4038}} dx$. Show your reasoning!

3. For which values of the positive number p does the infinite series converge? Explain your reasoning.

$$\sum_{n=1}^{\infty} \frac{n^3 - 4n^2}{n^p + 5}$$

4. (challenging) Find the sum of the series

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{6} + \frac{1}{8} + \frac{1}{9} + \frac{1}{12} + \dots$$

Hint: Try to view this series as an infinite sum of geometric series.