

Midterm Exam
Math 274
December 6, 2000

Name _____

Do all of your work on the blank paper provided. At the end of the exam, hand in your answers with this cover sheet. Include your name on all pages of your exam. The use of a graphing calculator is permitted.

§1 Calculation

1. Is the series $4 + \frac{8}{5} + \frac{16}{25} + \frac{32}{125} + \dots$ convergent? If so, then find its sum.
2. Is the series $\sum_{n=1}^{\infty} ne^{-n}$ conditionally convergent, absolutely convergent, or divergent?
3. Is the series $\sum_{n=1}^{\infty} \frac{2n^2 + 3n}{\sqrt{5 + n^5}}$ conditionally convergent, absolutely convergent, or divergent?
4. Is the series $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} n^2}{n^3 + 1}$ conditionally convergent, absolutely convergent, or divergent?
5. Is the series $\sum_{n=1}^{\infty} \frac{(-1)^n n^3}{2^n}$ conditionally convergent, absolutely convergent, or divergent?

§2 Comprehension

6. What is a series? What does it mean for an infinite series to converge.
7. List and briefly describe five different tests for the convergence of an infinite series.
8. Evaluate $\lim_{n \rightarrow \infty} r^n$.

§3 Application

9. Evaluate the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^5}$ accurately to 10^{-3} .
10. Evaluate the series $\sum_{n=1}^{\infty} \frac{1}{n^5}$ accurately to 10^{-3} .