

Math 142 - Midterm 3 Suggested Study Problems

Here are problems that are similar to the ones you might see on the exam.

Sequences Cht. 9 review # 3, 19

Geometric Series Cht. 9 review # 31, 33, 35, 37

p-Test Cht. 9 review # 45

Direct and Limit Comparison Tests Cht. 9 review # 49, 51, 52

Alternating Series Cht. 9 review # 55, 57, 59

Ratio Test Cht. 9 review # 61, 65, 66

Taylor Polynomials Cht. 9 review # 69, 71, 98, 99

Power Series Cht 9. review # 75, 77, 79, 85

Here are some additional problems that are not from the book. **At least one of these questions will be on the test!**

1. What does it mean for an infinite series to converge, i.e., what is the mathematical definition of convergence? Use this definition to explain why Grandi's series $1 - 1 + 1 - 1 + \dots + (-1)^n + \dots$ diverges. (See the definition on page 595 in the book.)
2. What is the harmonic series? Use an integral to explain why the harmonic series diverges. (See the Integral Test on p. 605 and apply it to $f(n) = \frac{1}{n}$.)
3. What is the difference between absolute vs. conditional convergence? Give examples of three different series, one that converges absolutely, one that converges conditionally, and one that diverges. (If you know the series that have names, like Grandi's series, Zeno's series, etc., then you should be able to answer this question!)

In addition to the questions above, make sure that you can recognize the three types of special series (geometric, alternating, and p-series) when you see them. Be sure that you know when these special series converge.