Section 10.2

1. Explain what is meant by the statement \( \sum_{n=1}^{\infty} a_n \) converges to \( s \). Use the definition of the limit to give a precise explanation of the statement.

2. Prove that, if \( \sum_{n=1}^{\infty} a_n \) converges, then \( \sum_{n=1}^{\infty} ca_n = c \sum_{n=1}^{\infty} a_n \).


Section 10.3

4. Prove the following: If \( a_n > 0 \), then the series \( \sum_{n=1}^{\infty} a_n \) converges if and only if the sequence \( s_n = \sum_{i=1}^{n} a_i \) is bounded.

5. State and prove the Integral Test.

6. State and prove the Comparison Test

7. State and prove the Limit Comparison Test

Section 10.4

8. Prove that, if \( \sum_{n=1}^{\infty} a_n \) is absolutely convergent, then \( \sum_{n=1}^{\infty} a_n \) is convergent.

9. State and prove the Alternating Series Test

10. State and prove the Ratio Test