

1. What is an analytic function?
2. State Abel's Limit Theorem.
3. What is a Tauber type theorem? Give one.
4. State Taylor's Theorem.
5. Define the exponential function as was done in class.
6. Present at least five properties of the exponential function.
7. Define the logarithm function as was done in class.
8. Define the trigonometric functions as was done in class.
9. Define the number π as was done in class. Sketch the proof that shows that π exists.
10. What is a trigonometric polynomial? What is a trigonometric series?
11. What is an orthogonal system of functions? How about orthonormal?
12. Define the Fourier coefficients and the Fourier series of a function f , relative to an orthonormal system of functions.
13. State Bessel's Inequality.
14. State the result that is needed for the proof of Bessel's inequality.
15. Write down the Dirichlet kernel and two of its properties. How about the Fejér kernel?
16. State the Localization Theorem.
17. State Parseval's Formula.
18. Describe the two methods of Riemann and Lebesgue integration, using an example similar to the one in class.
19. Discuss some of the advantages and disadvantages of the Lebesgue theory.
20. What is an interval in \mathbb{R}^N ? What is its volume?
21. Define the outer measure of a set $A \subset \mathbb{R}^N$.
22. The outer measure is monotone and subadditive. What does that mean?
23. What is the outer measure of a countable set? Prove your claim in detail.