Math 5210, Second Review of Definitions and Theorems

In addition to the topics for the first review, you should be familiar with Chapters 7, 8 and part of 9 of Rudin and chapter 5 of the notes. Here is a list of some of the more important topics. (References: R = Rudin, N = Notes)

Definitions

1. Equicontinuous family of functions (R Chap 7).
2. Algebra of functions, self-adjoint algebra, uniform closure of an algebra. (R Chap 7).
3. Trigonometric polynomials, Fourier series of a periodic function (R Chap 8).
4. L^2-inner product on functions, L^2- convergence of sequences of functions (R Chap 8).
5. Differentiable function $f : \mathbb{R}^k \to \mathbb{R}^n$, continously differentiable function, differential, Jacobian matrix (N Chap 5, R Chap 9).
6. Norm of a linear transformation (N Chap 5, R Chap 9).

Theorems

1. Inverse Function Theorem (N Chap 5, R Chap 9), examples (R Chap 9, exercises)
2. Characterization of compact subsets of $(C(X), d_\infty)$ for a compact metric space (X, d) (R Chap 7, Thms 7.24 and 7.25)
3. Stone-Weierstrass theorem and applications (R Chap 7).
4. Best L^2 approximation property of the Fourier sums $s_N(f, x)$, L^2-convergence of Fourier series, Parseval's Theorem (R Chap 8).
5. Apply Parseval's theorem to specific functions (R Exercises Chap 8).
6. Pointwise or uniform convergence of the $s_N(f, x)$ (R Chap 8).