

Math 425 – Midterm Study Topics

General principles:

- You may be asked to prove a result that is similar to a proof in the book. Write the proof; don't just say "it's like a proof in the book".
- Unless explicitly told otherwise, you may use any theorem (or lemma or corollary) from the sections of the text below, as well as results proved in Math 424. If you use a theorem, state clearly what you are using, like "By a theorem in the book we know that every continuous function on a compact set is bounded"; you don't need to give the number of the theorem.
- Do not use results from homework problems (even if they were assigned) unless you reprove them.

Section 3.2: Riemann/Darboux integration: know the definition of the Darboux integral, $U(f, P)$ and $L(f, P)$; Riemann-Lebesgue Lemma.

Section 3.3: Series: notion of convergence of series and absolute convergence. Ratio/root tests; comparison test; integral test.

Section 4.1: Uniform convergence and $C_b(M)$ and $C^0([a, b])$. Pointwise versus uniform convergence; $C_b(M)$ is complete in the uniform norm; series of functions and the Weierstrass M-test; integration and limits; differentiation and limits.

Section 4.2: Power series: radius of convergence; uniform convergence of series; differentiation and integration of power series.

Section 4.3: Equicontinuity and Arzela-Ascoli. Compactness of subsets of $C^0([a, b])$ under uniform norm.