Study Guide for Chap 08

1. Coverage: Sections 8.1-8.4, 8.7.

2. List all techniques of integrations (don't forget the 'half-angle' substitution $z = \tan(x/2)$), create a few examples for each of them and then solve. Then go through problems 69-116 on page 509 as a final review.

3. Study and memorize the convergence/divergence of $\int_0^a x^{-p}dx$ and $\int_a^\infty x^{-p}dx$ for the cases $0 < p < 1$, $p = 1$ and $p > 1$, respectively. Here a is an arbitrary positive number. The exact value of $a > 0$ is not important (why?).

4. Which comparison Theorems can be used to decide convergence/divergence of improper integrals?

5. How to determine convergence/divergence of an improper integral if it has multiple 'improper' parts such as the domain contains both $x \to \pm\infty$, and/or several points of discontinuity within the domain?