

## 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  $x \rightarrow \pm\infty$ , and/or several points of discontinuity within the domain?