

# MATH 31B REVIEW SHEET

## MIDTERM 2

Make sure to check CCLE for additional materials. Any handouts Prof. Aschenbrenner has given and any practice exercises will also be fair game for the exam.

*All page numbers etc. are from Rogawski.*

8.2: HW: 2, 8, 10, 12, 30, 42

Important examples: 1, 2, 4, 5

Know: technique for rewriting an integrand  $\sin^m(x) \cos^n(x)$  (p. 419)

reduction formulas for  $\sin^n x$ ,  $\cos^n x$  (p. 419)

antiderivatives of  $\sin^2(x)$ ,  $\cos^2(x)$  (p. 420)

useful trig identities, double-angle formulas (top of p. 420)

table of trig integrals (p. 423)

8.3: HW: 1, 2, 3, 4, 5, 8, 16, 26

Important examples: 1, 2, 3, 4

Know: substitution for integrals involving  $a^2-x^2$  (p. 427)

substitution for integrals involving  $x^2+a^2$  (p. 428)

substitution for integrals involving  $x^2-a^2$  (p. 429)

8.5: HW: 1, 2, 4, 10, 12, 14

Important examples: 1, 2, 3, 4

Know: partial fraction decomposition for distinct linear factors in denominator (p. 438)

partial fraction decomposition for repeated linear factors (p. 441)

8.6: HW: 4, 14, 16, 46, 48, 61, 63

Important examples: 2, 3, 4, 5, 7, 8, 9, 10

Know: definition of improper integral on an infinite interval  $[a, +\infty)$  (p. 448)

p-integral on an infinite interval  $[a, +\infty)$  (p. 449)

definition of improper integral when the integrand has an infinite discontinuity (p. 451)

p-integral on  $(0, a]$  (p. 451)

Comparison Test for Improper Integrals (p. 453)

8.8: HW: 2, 4, 28, 40, 48

Important examples: 2, 3, 4, 5, 6

Know: Trapezoidal Rule (p. 465)

Midpoint Rule (p. 466)

Error bounds for Trapezoidal Rule and Midpoint Rule (p. 467)

Simpson's Rule (*Note: Simpson's Rule only applies for even values of  $N$* ) (p. 469)

Error bound for Simpson's Rule (p. 470)

9.1: HW: 3, 4, 6, 8, 20

Important examples: 1, 3, 4, 5

Know: Formula for arc length (p. 479)

Approximating arc length (p. 480)

Formula for surface area of a surface of revolution (p. 481)

9.2: HW: 2, 6

Important examples: 1, 2, 3, 4

Know: Formula for fluid pressure (p. 485)

Formula for fluid force on a flat surface submerged vertically (p. 486)

Technique for force on an inclined surface (p. 487)

9.4: 2, 4, 6, 18, 32, 46, 50

Important examples: 1, 2, 3, 4, 6, 7

Know: definition of  $n$ th Taylor polynomial of a function at a point (p. 499)

how to get the  $n$ th Taylor polynomial from the  $(n-1)$ st Taylor polynomial (p. 500)

error bound for  $n$ th Taylor polynomial (p. 503)

definition of  $n$ th remainder (p. 505)

Taylor's Theorem (p. 505)