Calculus 131, Chapter 8 Summary ~ things you should know

notes by Tim Pilachowski

from Chapters 1-7

finding limits

slope of a curve at a point = slope of line tangent to the curve at that point = (instantaneous) rate of change of

the curve at that point = first derivative evaluated at that point

power rule constant-multiple rule, sum rule

derivatives of basic trigonometry functions (sine, cosine, tangent)

product rule, quotient rule, chain rule

the natural exponential function, $y = e^x$, and the natural logarithm function, $y = \ln x$, with derivatives

integration via antiderivative, evaluating definite integrals

integration by substitution, evaluating definite integrals

> change of limits rule – useful but not necessary

Chapter 8 - Important concepts:

midpoint rule, trapezoidal rule, Simpson's rule

integration by parts (Memorize the process and formula.)

> evaluating indefinite and/or definite integrals

average value of a function

improper integrals

Be able to:

use the midpoint rule, trapezoidal rule and Simpson's rule to approximate a definite integral

identify the correct process needed to evaluate an integral

evaluate an indefinite integral via anti-derivative, substitution or parts

evaluate a definite integral using the given limits/boundaries of integration

use a given formula to set up and evaluate the integral needed to answer a question

determine whether an improper integral is convergent (and state the value to which it converges) or divergent

(as always) interpret and solve life science applications similar to those in the text and on discussions

> worksheets

Review exercises from the text:

Chapter 8 Review, 1 – 20, 25 – 26, 35 – 36, 39 – 50 (answers to odd-numbered problems are in the back