

# Review for Exam 3

MATH 131: Calculus II, Section 2

**IMPORTANT:** We will be taking our third exam on Thursday, November 15th in Gulick 2000 (our lab room). Bring a pencil (or two) and an eraser. You should NOT use pen on the exam unless you have some kind of erasable pen. I will provide you with a non-graphing calculator. Remember that there will be randomized seating at the exam. You may want to wait until the names have been laid out before taking a seat .

## Know When and How To...

- (1) use simplification to integrate.
- (2) use  $u$ -substitution to integrate.
- (3) use integration by parts to integrate.
- (4) use the technique for products of powers of trigonometric functions to integrate.
- (5) use trigonometric substitution to integrate (remember sometimes we need to complete the square).
- (6) use partial fractions to integrate (remember sometimes we need to use long division).
- (7) combine techniques from (1)-(6) to integrate.
- (8) evaluate limits of indeterminate forms.
- (9) interpret integrals as improper integrals of type 1 or type 2.
- (10) use the theorem about  $\int_1^\infty \frac{1}{x^p} dx$ .

## Remember...

- (1) to review your flow chart!
- (2) integration formulae 1-9 and 13-15 from the list of basic integrals listed in the back of the text.
- (3) differentiation formulae (like inverse trigonometric functions) too! (We need them when searching for  $dx$ .) These aren't different formulae, these are just the ones mentioned above in reverse!
- (4)  $\sin^2 x + \cos^2 x = 1$ ;  $\tan^2 x + 1 = \sec^2 x$ ;  $\cot^2 x + 1 = \csc^2 x$
- (5)  $\sin 2x = 2 \sin x \cos x$
- (6)  $\sin^2 x = \frac{1}{2}(1 - \cos 2x)$ ;  $\cos^2 x = \frac{1}{2}(1 + \cos 2x)$
- (7) your family! ( $+C$  on your indefinite integrals)
- (8) to say "convergent" or "divergent" when evaluating improper integrals.
- (9) to bring a pencil with a good eraser.
- (10) to ask me questions if you are stuck or need clarification.
- (11) to breathe!

**Practice:** Here are some additional problems with which to practice from the Chapter 7 Review on pages 593-594: 1, 35, 37, 39-53 odd, 59, 61, 65-73 odd. If you don't have time to do all these problems, it would be good practice to see if you know how to start them. Please first try all of these without looking at your textbook or notes!

**NOTE:** This is a **rough** outline. The exam will be over 7.1-7.6, and 7.8. You should be sure to review all of your homeworks (main, reading and WeBWorK), labs and notes from these sections. Recall that all lab keys are posted on our website.