Your final exam will be given on Monday, December 15 from 1:00 pm to 2:50 pm in room EP 252. You may bring one sheet of notes into the exam. Final exam questions will be taken only from material in text sections listed below (Calculus, Larson et. al. 8th edition). Of course, some preliminary ideas used in these sections were developed in other sections, and cannot be ignored! Assigned homework problems and previous exams are your best guides in preparing for the final exam. Class notes and textbook examples should be useful as well. You may see more short answer questions than on previous exams (true-false? multiple choice?)

5.1 You can expect differentiation problems similar to 45-59. You should also review the algebra of logs as in problems 19-34.

5.2 You should be able to do basic integrals as in problems 1-24, especially those involving $u$-substitution.

5.4 Be able to differentiate and integrate exponential functions as in problems 35-55 (omit 47) and 85-103.

5.6-5.7 You should know the basic differentiation formulas for the inverse sine and tangent functions, and the corresponding integration formulas. Formulas for cosine and secant are less important and won’t appear on the test.

7.6 Be able to compute the center of mass for a plane lamina. Problems 13 and 15 are representative. (You will want formulas from this section on your note sheet.)

8.2 Integration by parts is an important, often used tool. You should know and be able to apply the basic formula on page 525. Understand how integration by parts applies to definite integrals (as in problem 47).

8.5 Partial fraction decomposition is a useful tool. Problems 7, 15, 17 and 21 nicely illustrate the various cases that you should be familiar with. Problems involving considerably more complicated partial fraction decompositions will not appear on your exam.

8.8 Recognize an improper integral and be able to compute its value or show that it diverges. Be particularly careful about limit notation. Recall that integrals may be improper due to discontinuities in the integrand OR due to an infinite limit of integration. Examples 1, 2, 6, 7, and 8 illustrate the various cases.

9.2-9.3 Theorems 9.6 and 9.9 are the two main results in section 9.2, illustrated by examples 3 and 5. Pay particular attention to example 5c. In section 9.3, the only result of interest is Theorem 9.11.

9.7 Taylor approximations are extremely important in many applications of mathematics. Know how to construct a Taylor polynomial (examples 3-7 and problems 13-29 odd). Use a Taylor polynomial of degree $n$ to approximate a function at a particular point (problems 41, 43). There will be no questions about the remainder (error) $R_n(x)$.

9.8 Theorem 9.20 gives the basic facts about convergence of power series. You should be able to apply it as in examples 5, 6, and 7. (Note that the ratio test from section 9.6 is the fundamental tool for determining convergence of power series. Also, the alternating series test from section 9.5 may show up in testing the endpoints.) There will be no questions involving differentiation or integration of power series.

10.2 Problems 3-13 odd and 39-46, 51, 53 nicely summarize the most important ideas in parametric equations.

10.3 Problems 1-9 odd and 16 summarize the most important ideas of this section

10.4 Convert from polar to rectangular or rectangular to polar coordinates (very important!). Sketch basic polar graphs by plotting points. You do not need to memorize the table on page 735, nor do you need to copy it into your note sheet. We did not discuss (and so you are not responsible for) the idea of tangent lines at the pole, as mentioned in exercises 73-79 odd.

10.5 Compute basic polar areas as in problems 1-9 odd, 37 and 39.