

Reading Assignment for Section 5.5

MATH 131: Calculus II, Section 1

Spring Semester 2014

Follow the general guidelines for the Reading Assignment (the salmon colored handout).

Be sure to include and label all four standard parts 1,2,3,4 of the Reading Assignment in what you hand in. Be sure to **staple** together pages if you have more than one, and include your **name** at the top of at least the first page. Neatness is appreciated!!!

Due: by the beginning of class on Friday, February 7th

Read:

Section 5.5, pages 357-363: Substitution Rule

Notes:

Now that we have the Fundamental Theorem of Calculus in our tool box and know that we can use antidifferentiation to solve definite integrals, it is even more important for us to expand our ability to find antiderivatives. Up to this point, our ability to find antiderivatives has been limited to a small number of functions that fit into certain formulas. What happens if we have a composition of functions? This section teaches a strategy for integrating some functions that are really compositions of functions. Note that this will NOT help us with all compositions, but it will help us with many and we will use this technique a lot.

Remember that your answers should include complete sentences for every question. Be sure to address all parts of each question.

Reading Questions for part (1):

a) Let $f(x) = \ln(x^4 - 7)$. What is the **derivative** of $f(x)$? What rule did you use to find the derivative and why? Given your results and the relationship between differentiation and integration, what new indefinite integral formula do you have? (I am not looking for a general formula here, just a very specific one in relation to the function you were given and derived at the beginning of this question.)

b) Explain why the Substitution Rule is referred to as a change of variables.

c) If we decide to make the substitution $u = x^2 + 8$ in order to evaluate the definite integral $\int_2^4 f(x)dx$, what would the new limits of integration be? Show your work and briefly explain why.

Remember parts 2-4 on the salmon handout! **Reread the directions for these parts to be sure that you are answering the questions.** If you have lost your salmon handout, there is a link on our website to the Homework Guidelines.