

# Quiz # 2 and Exam # 2 Review Sheet

Woodstock

November 2, 2007



*Hi everyone! Woodstock here, the unusually quiet cartoon character who you can never understand, since it appears that I never ever speak english, but a language consisting of only  $||||$  symbols. Not many people know this, but I'm actually an avid Bridge player. You know. That card game for old ladies. Corey is an avid Bridge player, too. But he's no old lady. All of that being said, here is the information about the upcoming quiz and test. Corey had considered postponing or cancelling the quiz due to the school closure, but has been reminded that it is important to follow the syllabus you give at the beginning of the term. So, the upcoming quiz will cover sections 4.5 and 5.1, and will be on Thursday November 8th. The upcoming exam will cover sections 4.5, 5.1, 5.2, 5.3 and 5.4, and will be on Thursday November 15th. Please remember the Corey will be out of town, leaving the morning of November 10th and not returning until Sunday evening November 18th, and so it is unlikely you will get to see the quizzes before the exam, but Corey will try his hardest. So without further ado, here are my thoughts about those sections. Oh, and ROCK ON!*

1. Section 4.5: The substitution rule. This section is really important. The substitution rule is a technique that allows one to integrate functions that are just a little bit different than those on our short list we developed at the beginning of the course. I suggest that you learn this method very carefully. But what do I know, I'm just a quasi-talking bird. But I have feelings, too. Numbers 7–34 and 43–56 are great study questions. Please also don't forget that Corey covered the topic "average value" . . . he

mistakenly thought he had covered it before, but the wildfires distracted him. Corey intends to ask you a question about average value on the quiz and possibly the exam, so he encourages you to study this topic as well. You can find it in your book on pages 286–287, and homework questions 47–50 on page 291 (although this is technically part of Section 4.4, this material certainly belongs on this review sheet).

2. Section 5.1: The Natural Logarithmic function, differentiation. This section, along with most of the others in Chapter 5, is really just a review of a basic function that has a funny definition. We will move rather quickly through these sections, and Corey will be sure to highlight the things you'll need to know. For instance, know the basic properties of the logarithm function, and its derivative. For this section, it's that simple.
3. Section 5.2: The natural logarithmic function, integration. For this section, you'll need to know, basically, the opposite of section 5.1. That is, there are A LOT of functions out there whose antiderivatives have to do with the natural logarithm. This section just explores how exactly the natural logarithm rears its ugly head, in particular, how the substitution rule can be involved with this process. The examples in class and the homework are great problems to study.
4. Section 5.3: Inverse functions. This section is a good section for you all. See, it's one of those sections where Corey really doesn't want to ask much about, but some of the future development of the class depends on the information contained therein. Really, for this class, there are three important things to remember from this section. First, inverse functions need not always exist, but almost all the time you and I could make the domain a little smaller so that said function does have an inverse. Second, you should know how to find an inverse, should it exist. Of course, lots of times functions' inverses are difficult to find, and Corey wouldn't ask you about anything like that. But knowing the process is important (do be careful to keep in mind the domains in question are very important!) Third, and finally, the whole point of this section is to provide a method for finding derivatives of functions whose definitions are as inverse functions. The best and first example is the exponential function  $e^x$ . As we defined it, it's the inverse of the  $\ln$  function. Armed with only that information (and in my case, a doggie friend that lays on his doghouse all the time) we are somehow able to find its derivative. I would suggest you know that derivative (Hint:  $(e^x)' = e^x$ ). Then, learn the corresponding integral formula, and work the heck out of it (translation: be able to answer the kinds of problems we learned about before (from this class and math 211), but with regards to the new functions we're learning about). See problems 33-64 of section 5.4 for examples of that. More specifically, though, when looking at the homework, focus your efforts on the ones that Corey has assigned – after all, it seems like he spent a lot of time figuring out exactly what questions to ask you, so it's likely he'd ask quiz and exam

questions that are similar to those. He doesn't want to waste your time.

5. Section 5.4: Exponential functions, derivatives and integrals. In this section, all we learn is that  $\frac{d}{dx}e^x = e^x$ , and  $\int e^x dx = e^x + C$ . We sort of already knew that. BUT: what's hard for you guys is that you have to go back and answer questions like number 47 from this section:

Compute the derivative of  $F(x) = \int_{\pi}^{\ln x} \cos(e^t) dt$ .

Remember, though, that's all these questions are. It's the same process with different functions involved. You know how to do these questions already, just include the new info regarding derivatives and integrals of these new functions into your brain and you'll be able to do them.

6. Other thoughts. The quiz and test will be roughly the same format as before, and I hope the quiz provides you with an excellent practice tool to succeed at the test. Although I won't be there physically, I will be there mentally and emotionally, as I'd like you all to succeed. There will be a substitute, my trusted friend Dr. Dyakevich, who will answer any review questions you have and will lecture somewhat on Tuesday. Then on Thursday, Dr. Dyakevich will be there to proctor the exam. She really is an excellent teacher who really knows her stuff. I expect you'll all be able to learn as much from her as you would from me. So good luck! And be sure to ROCK ON!!!!