

## Math 125 End of Week 2 Newsletter

### UPCOMING SCHEDULE:

- Friday: Section 5.4/5.5 (net change/total change and substitution rule)  
Monday: Section 5.5/6.1 (more substitution, then area applications)  
Tuesday: Homework discussion and test prep (bring lots of homework questions!)  
Wednesday: Section 6.1/6.2 (Area/Volume - Choose dx or dy?)  
Thursday: Worksheet 3 - Areas Between Curves:  
<https://www.math.washington.edu/~m125/Worksheets/AreaBetweenCurves.pdf>  
Next Friday: Section 6.2/6.3 (Volumes of Revolution: Cross-sectional method and shell method)  
Worksheet 1 solutions are here: <https://www.math.washington.edu/~m125/outline1.php>  
Worksheet 2 solutions are here: <https://www.math.washington.edu/~m125/outline2.php>

**HOMEWORK:** Closing Wednesday: HW\_2A, 2B, 2C (5.3, 5.4, 5.5)

**NEW POSTINGS:** Course website: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/index.html>

- Section 5.5: discussion of what is going on when we do substitution (Read this!):**  
<https://sites.math.washington.edu/~aloveles/Math125Fall2019/w12m125substitution.pdf>
- 5.5: Basic Substitution Practice Problems.** Do ALL these in addition to your homework, you need LOTS of practice to master substitution. It is the most important method we learn all term and we use it a ton.  
A List of Basic Practice Integrals that only require simplification of substitution.  
<https://sites.math.washington.edu/~aloveles/Math125Fall2019/BasicIntegralPage.pdf>  
sol'ns: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/BasicIntegralPageSolutions.pdf>
- 5.5: An old "Hard" Substitution Quiz** (students told me this was a hard quiz):  
Quiz: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/uSubstitutionQuiz>  
sol'ns: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/uSubstitutionQuizSolns.pdf>  
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- 6.1-6.3:** A very important first step for all problems in chapter 6 is to choose dx or dy. Once you draw the region you can decide this in moments just by looking at the picture! See the following quiz to practice choosing dx or dy:  
dx/dy Quiz: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/AreaBetween.pdf>  
sol'ns: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/AreaBetweenSolutions.pdf>  
It is very important that you can make this observation dx or dy as step 1 for all problems in chapter 6. Then based on that choice you will have other things to do. But first you need to make the correct choice!!! We will be practicing in class.
- 6.1-6.3 Overview:** <https://sites.math.washington.edu/~aloveles/Math125Fall2019/Chapter6.pdf>

### HOMEWORK HINTS:

On HW\_2A: The typical issues in office hours have been algebraic simplification so that an antiderivative can be found. One bigger issue was a couple of students forgot the connections between the graph of a function and its derivative. If you have forgotten this, then here are a reminder (referring to questions 1 and 11 on this homework)

- $f(x)$  have a horizontal tangent exactly when the derivative,  $f'(x)$ , is zero!
- $f(x)$  is increasing exactly when the derivative,  $f'(x)$ , is positive!
- $f(x)$  is decreasing exactly when the derivative,  $f'(x)$  is negative!

If you have forgotten these connections, see my review here:

<https://sites.math.washington.edu/~aloveles/Math112Winter2018/m112%20Intro%20To%20Derivatives.pdf>

And I have a bunch of examples on pages 3, 4, and 5 of this old review from math 124:

<https://sites.math.washington.edu/~aloveles/Math112Winter2018/m112review10-1-10-3.pdf>

On HW\_2B: Questions 9 and 10 are about displacement and total distance as we will discuss in class and you did in the worksheet. Note: We often ask questions like these on the midterms!

On HW\_2C: These are mostly about substitution! See lectures, book and review above. Do lots of practice!!!

In addition, the last five problems of HW\_2C are applied problems. It is very important that you understand how to work with initial conditions in order to find the constant of integration. These problems will help you practice this.

## OLD EXAMS:

The departmental exam archive is here: <https://www.math.washington.edu/~m125/Quizzes/Q4.php>

Personal exam archive: <https://sites.math.washington.edu/~aloveles/Math125Fall2019/LovelessExamArchive.html>

*Targeted practice:*

**for practice using Section 5.3 material:** *Fundamental Theorem of Calculus Part 1*

Problem 3b: <https://www.math.washington.edu/~aloveles/Math125Winter2017/sp16m125e1.pdf>

Problem 2: <https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1.pdf>

Problem 2: [https://www.math.washington.edu/~m125/Quizzes/week4/win13\\_mid1.pdf](https://www.math.washington.edu/~m125/Quizzes/week4/win13_mid1.pdf)

Problem 2: <https://www.math.washington.edu/~aloveles/Math125Spring2016/w12m125he1.pdf>

Problem 2: <https://www.math.washington.edu/~aloveles/Math125Spring2016/f09m125e1.pdf>

**for practice using Section 5.4 material:** *net change and total change:*

Problem 4: <https://www.math.washington.edu/~aloveles/Math125Winter2017/sp16m125e1.pdf>

Problem 3: <https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1.pdf>

Problem 1: <https://www.math.washington.edu/~m125/Quizzes/week4/mid1a.pdf>

Problem 3: <https://www.math.washington.edu/~aloveles/Math125Spring2016/f09m125e1.pdf>

Problem 2: <https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1h.pdf>

**for practice using Section 5.5 material:** *u-substitution:*

Problem 1b and 2: <https://www.math.washington.edu/~aloveles/Math125Winter2017/sp16m125e1.pdf>

Problem 1(b)(c): <https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1.pdf>

Problem 2: <https://www.math.washington.edu/~m125/Quizzes/week4/mid1a.pdf>

Problem 1(b)(c): [https://www.math.washington.edu/~m125/Quizzes/week4/win13\\_mid1.pdf](https://www.math.washington.edu/~m125/Quizzes/week4/win13_mid1.pdf)

Problem 1(b)(c): <https://www.math.washington.edu/~aloveles/Math125Spring2016/f09m125e1.pdf>

## STUDYING ADVICE:

MY EXAM STUDYING STRATEGY WHEN I WAS A STUDENT: I always like to share how I studied when I was in graduate school. I was an okay student as an undergraduate, but I was an excellent student in graduate school (I got perfect scores on every exam in graduate school in my first year). Here is how I did it:

1. **At least 1 week before an exam**, spend an intense night of studying. Try to trick yourself into thinking the exam is the next day. Work through several old exams. This studying should consist of 2 elements:
  - a. *Problem recognition:* Flip through lots and lots and lots of exams quickly and see if you can figure out how to quickly start each problem.
  - b. *Working out the details:* Carefully work through a few exams in details to practice finishing problems and to practice being careful with your work.
2. After this intense studying session, talk to me or your TA or someone in the MSC to clear up any confusion you have. (Or, like I did, just keep thinking about it on your own and trying examples until you figure it out yourself).
3. **Then at least 2 days before the exam**, put in another night of intense studying. Then when the instructor reviews in class, all the concepts will be fresh in your mind and you will be able to ask good questions.

More days of studying is better. I often started two-three weeks in advance, this is the condensed version. But, if you only could devote two nights to studying, then this is an efficient and effective use of your time and it gives your mind more time to process the information. I hope some of this helps. Now you have to put in the time and effort to really get to know these concepts well. If you find something helpful in these newsletters, please share it with your classmates.

Hope some of this helps.

- Dr. Andy Loveless