Math 125 End of Week 3 Newsletter

UPCOMING SCHEDULE:

Friday: Section 6.2/6.3 (Volumes by Cross-sectional slicing, intro to shells)
Monday: Section 6.3 (Cylindrical Shells and Volumes of Revolution summary)
Tuesday: Homework discussion and test prep (bring lots of homework and exam questions!)
Wednesday: Exam 1 Review (bring lots of homework and old exam questions)
Thursday: **Midterm 1! Covers 4.9, 5.1-5.5, 6.1-6.3**
Next Friday: Section 6.4 (Work: Cables, Pumping)

Reminder: WS 3 (Area between curves) sol'ns will be here: https://www.math.washington.edu/~m125/outline3.php
WS 4 (Volume of revolution) sol'ns will be here: https://www.math.washington.edu/~m125/outline4.php

HOMEWORK: Closing **TUESDAY**: HW_3A, 3B, 3C (these cover 6.1, 6.2, and 6.3)
Important Note: You need to finish 3A, 3B, 3C well before the closing date (I suggest by Monday night). You are definitely expected to know this material for the exam. NOTE THAT IT IS CLOSING ***TUESDAY***!!! I am doing this to force you to be done with this before we review on Wednesday and so that you are ready for exam 1 which is Thursday.

NEW POSTINGS: There are several new postings on the course website:

1. ***Overview of 6.1-3***: https://sites.math.washington.edu/~aloveles/Math125Winter2019/Chapter6.pdf
2. ***Quick Overview for Exam 1***: https://sites.math.washington.edu/~aloveles/Math125Winter2019/Exam1Review.pdf
3. *Remember that* ***lecture materials are posted here****:* https://sites.math.washington.edu/~aloveles/Math125Winter2019/lecture.html

HOMEWORK COMMENTS AND HINTS (based on common questions from last year):
Warning: There are a few challenging problems in HW_3A, 3B and 3C. Historically, students really struggle with

- ***The last problem in 3A,***
- ***The last two problems in 3B (especially the last problem)***
- ***Problems 10, 11, and 14 in 3C (especially 10 and 14)***

So be ready for these when you get to them. You will have to stretch your thinking and take your time. Let yourself struggle a bit, then visit a tutor or ask in quiz section, but see how far you can get on your own first. Here are a few comments:

On HW_3A: Last problem: In part (b), start by drawing an accurate picture of $y = 1/x^2$ on the interval x = 1 to x = 4. Then draw a horizontal line that appears to cut the region in half (note that it will be above y = 1/16) and label it y = b. Now set up an integral and find when the area you get is half, then solve for *b*.

On HW_3B: On 9 and 10, start by drawing a 2D region that would give the solid in question by rotating.
In 9, you will draw a circle and give the equation for a circle.
In 10, you will draw two circles and you'll start by finding an intersection. I suggestion you put one circle centered at the origin. You'll have to think about these a bit, so make sure to attempt them early and ask about them in quiz section, in the MSC, in CLUE, or in office hours.

On HW_3D:
On the torus problem, you'll have to do quite a bit of set up. And once you set it up you may have to do a substitution. At some point you will break up your integral into two problems; one you can do quickly, but the other will look like $\int_{-r}^{r} \sqrt{r^2 - x^2}\,dx$. We currently do not have any algebraic methods for finding this integral (we will in section 7.3). BUT you don't need algebraic methods, if you draw the picture that goes with this integral you realize it is exactly half the region bounded by a circle with radius *r* which you should know has area ½ π r².
So use $\int_{-r}^{r} \sqrt{r^2 - x^2}\,dx = \frac{1}{2}\pi r^2$. That will save you a lot of headache.

On Problem 14, think shells! $\int_0^{16} 2\pi(Radius)(Height)dx$.
Using the table, you know the values of $dx \approx \Delta x$, *Radius*, and *Height,* then compute $2\pi(Radius)(Height)\Delta x$ for each one to get volume of approximations and add them up.
Watch out for units!

OLD EXAMS:
The math departmental exam archive is here: https://www.math.washington.edu/~m125/Quizzes/Q4.php
My personal archive: https://sites.math.washington.edu/~aloveles/Math125Winter2019/LovelessExamArchive.html

Now would be a good time to reread some things from my website including:
Math 125 Full Exam Rules and Advice:
https://sites.math.washington.edu/~aloveles/Math125Winter2019/Math125GeneralExamRules.pdf
Quick Checklist of Rules and Topics for Exam 1:
https://sites.math.washington.edu/~aloveles/Math125Winter2019/Exam1%20Review%20-%20w19.pdf

Targeted practice (see previous newsletters for targeted practice on previous sections):

for practice using Section 6.1 material (*Area between curves):*
Problem 5a: https://www.math.washington.edu/~aloveles/Math125Winter2017/sp16m125e1.pdf
Problem 5: https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1.pdf
Problem 5a: https://www.math.washington.edu/~aloveles/Math125Spring2016/w15m125e1.pdf
Problem 4: https://www.math.washington.edu/~aloveles/Math125Spring2016/m125sp06e1.pdf
Problem 5: https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1h.pdf

for practice using Section 6.2 material *(Volumes by perpendicular slicing):*
Problem 6ab: https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1.pdf
Problem 5: https://www.math.washington.edu/~m125/Quizzes/week4/win13_mid1.pdf
Problem 6(a)ii: https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1h.pdf
Problem 5b: https://www.math.washington.edu/~aloveles/Math125Spring2016/w15m125e1.pdf
Problem 4b: https://www.math.washington.edu/~aloveles/Math125Spring2016/w13m125he1.pdf

for practice using Section 6.3 material *(Volumes by cylindrical shells):*
Problem 6c: https://www.math.washington.edu/~aloveles/Math125Spring2016/w11m125e1.pdf
Problem 5c: https://www.math.washington.edu/~aloveles/Math125Spring2016/w15m125e1.pdf
Problem 4a: https://www.math.washington.edu/~aloveles/Math125Spring2016/w13m125he1.pdf
Problem 4cd: https://www.math.washington.edu/~m125/Quizzes/week4/win16_bekyel_1.pdf

Hope this helps.

- Dr. Andy Loveless