Math 125 End of Week 3 Newsletter

UPCOMING SCHEDULE:

Friday:	Section 6.2 (Volumes by Cross-sectional slicing)
Monday:	Section 6.3 (Volumes by Cylindrical Shells and Volumes of Revolution summary)
Tuesday:	Homework discussion and review (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)

HOMEWORK: Closing **TUESDAY**: 6.1, 6.2, 6.3 HW

Important Note: You need to work on these this weekend (try to finish 6.1 and 6.2 before Monday)
NOTE: These are 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 including…

1. ***Overview of 6.1-6.3***
2. ***Exam 1 Rules and List of Topics***
3. ***Quick Summary of each Topic for Exam 1***

HOMEWORK COMMENTS AND HINTS (based on common questions from last year):

Warning: There are a few challenging problems in 6.1, 6.2 and 6.3. Historically, students really struggle with…

- ***The last problem in 6.1 (see the discussion board as well as the hint below)***
- ***Problems 10 and 11 in 6.2 (especially the problem 11)***
- ***Problems 9, 10, and 11 in 6.3 (especially 9 and 10)***

First focus on the other problems making sure you have the general idea. Then attempt these harder problems. Let yourself struggle a bit, then visit a tutor or ask in quiz section or on the discussion board, but see how far you can get on your own first. Here are a few comments/hints:

On 6.1 / Problem 8:

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 6.2: On 10 and 11, 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 their intersections. I suggestion you put one circle centered at the origin.

On 6.3 **Problem 9: - Please Read**…

On this 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 $\int_{-r}^{r} \sqrt{r^2 - u^2}\,du$. 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 $\frac{1}{2}\pi r^2$. 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 6.3 Problem 11: 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,* so compute $2\pi(Radius)(Height)\Delta x$ for each one to get volume approximations and add them up.
But, Watch out for units!

more hints on the next page…

OLD EXAMS:
The math departmental exam archive is here: https://sites.math.washington.edu/~m125/Quizzes/Q4.php
My personal archive: https://sites.math.washington.edu/~aloveles/Math125Materials/LovelessExamArchive.html

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

for practice using Section 6.1 material (*Area between curves):*
Problem 5a: https://sites.math.washington.edu/~aloveles/Math125Materials/sp16m125e1.pdf
Problem 5: https://sites.math.washington.edu/~aloveles/Math125Materials/w11m125e1.pdf
Problem 5a: https://sites.math.washington.edu/~aloveles/Math125Materials/w15m125e1.pdf

for practice using Section 6.2 material *(Volumes by perpendicular slicing):*
Problem 6ab: https://sites.math.washington.edu/~aloveles/Math125Materials/w11m125e1.pdf
Problem 5b: https://sites.math.washington.edu/~aloveles/Math125Materials/w15m125e1.pdf
Problem 4b: https://sites.math.washington.edu/~aloveles/Math125Materials/w13m125he1.pdf

for practice using Section 6.3 material *(Volumes by cylindrical shells):*
Problem 6c: https://sites.math.washington.edu/~aloveles/Math125Materials/w11m125e1.pdf
Problem 5c: https://sites.math.washington.edu/~aloveles/Math125Materials/w15m125e1.pdf
Problem 4a: https://sites.math.washington.edu/~aloveles/Math125Materials/w13m125he1.pdf

Hope this helps.

- Dr. Andy Loveless