Math 124 End of Week 3 Newsletter

UPCOMING SCHEDULE:

Friday:	Section 2.8 (The Derivative Function)
Monday:	Section 3.1/3.2 (Intro to derivative rules)
Tuesday:	Velocity and Parametric Equations worksheet: http://www.math.washington.edu/~m124/source/worksheets/aut_ws4.pdf (This will give you practice with derivative rules and you will start to see how they appear in applied motion problems which we will cover more after the midterm)
Wednesday:	Section 3.2/3.3 (Basic Derivative Rules, start trig)
Thursday:	Homework discussion and test prep (bring homework questions!)
Next Friday:	Section 3.3 /3.4 (Trig Derivative Rules, start chain rule)

NOTE: Exam 1 is Tuesday, January 31st , it covers 10.1, 2.1-2.3, 2.5-2.8, 3.1-3.3.

WORKSHEET 3 (from Tuesday's quiz section) has solutions posted here:
http://www.math.washington.edu/~m124/source/worksheets/aut_ws3sol.pdf
(Review this worksheet solution for practice with the connections between the graphs of functions and their derivatives).

HOMEWORK:

Closing Friday:	hw06S2.7
Closing Monday:	hw07S2.7-8
Closing Wednesday :	hw08S2.8
Closing Next Friday:	hw09S3.1-2

PREVIOUS HOMEWORK STATS:

hw04S2.3:	median score = 95%,	median time browser open to assignment = 83 minutes
hw05S2.5-6:	median score = 97%,	median time browser open to assignment = 253 minutes

HW Notes:

hw06S2.7 notes:

- The first question is the squeeze theorem (should be very fast to do).
- We did two full examples in class that are like problems 2-4. Problems 5 and 6 are applied problems, but ultimately you use the same techniques as you used in problems 2-4. Visit the MSC if you are having trouble getting 5 and 6 started (or ask in quiz section).

hw07S2.7-8 notes:

- You do more examples like those in 2.7, but this time it is with a variable instead of a number (we now are talking about the derivative function). We will see more examples on Friday. You also start to see examples with units and interpretation (which we'll do more of on Friday).
  Here is a quick example: If x = time (in seconds) and y = distance (in feet), then the derivative (the slope of the tangent) is in units of distance/time (feet/second). So in this example, the derivative is velocity.
  Another example: If x = quantity (in pounds) and y = price (in dollars), then the derivative would give the price per pound (dollars/pound).In other words, the units of the derivative are always the y-units over the x-units. Remember the derivative is a slope so it is a rate.

hw08S2.8 notes:

- These are questions about the connection between a function's graph and its derivative graph. You started to explore these connections in the worksheet this week. So you could start to attempt these problems now! It would be good to look ahead at these problems. And on Friday, I will do more examples.

NEW POSTINGS

Remember the course website is here: http://www.math.washington.edu/~aloveles/Math124Winter2017/index.html
There are several new postings:

1. **Overview of 2.7, 2.8, 3.1, and 3.2**:
   http://www.math.washington.edu/~aloveles/Math124Winter2017/m124week3review.pdf
2. **Connections between functions and derivatives (handed out last Tuesday):**
   http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Intro%20To%20Derivatives.pdf
3. **Several Postings to Review and Practice Limits**:

a) **A basic graphical review of some limits we should know**:
   http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Functions%20And%20Limits.pdf

b) **Brief Summary of Limit Strategies (this was posted last week)**:
   http://www.math.washington.edu/~aloveles/Math124Winter2017/Limit%20Strategies.pdf

c) **30 Randomly Selected Limit Problems from Old Exams** (TRY THESE FOR PRACTICE!!!):
   http://www.math.washington.edu/~aloveles/Math124Winter2017/m124LimitsPractice.pdf
   Solutions are posted here:
   http://www.math.washington.edu/~aloveles/Math124Winter2017/m124LimitsPracticeSolutions.pdf

SUPPLEMENTAL POSTING

1. **Proof of a limit for sin(x)/x**: Next week we will need the limit for sin(x)/x as x goes to 0. It takes some work to prove the value of this limit (and the value we get is only true if we are in radians). The book gives a brief proof of this fact. In the following postings, I give the proof with some additional details that you might find interesting (a review of some trig and arc length). This is for your own interest, you do not need to know this proof:
   http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Trig%20Limit.pdf

OLD EXAMS:

Remember, the departmental exam archive is here:
   http://www.math.washington.edu/~m124/SampleMid1.php
and my personal exam archive is here:
   http://www.math.washington.edu/~aloveles/Math124Winter2017/LovelessExamArchive.html

Here are infinite limit problems (2.6) from old midterms:
Problem 1c from: http://www.math.washington.edu/~aloveles/Math124Winter2017/m124w16e1.pdf
Problem 1a from: http://www.math.washington.edu/~aloveles/Math124Winter2016/nichifor2011.pdf
Problem 1a from: http://www.math.washington.edu/~m124/source/Exams/Midterm1/2015aut/pezzoli.pdf
Problem 1c from: http://www.math.washington.edu/~aloveles/Math124Winter2016/m124w13e1.pdf
Problem 1b from: http://www.math.washington.edu/~aloveles/Math124Winter2016/conroy2010.pdf
Problem 2a from: http://www.math.washington.edu/~m124/source/Exams/Midterm1/2013spr/pezzoli.pdf
Problem 2b from: http://www.math.washington.edu/~aloveles/Math124Winter2016/exam1v1.pdf

Here are some general derivative problems (2.7-2.8) from old midterms:
Problem 3 from: http://www.math.washington.edu/~aloveles/Math124Winter2017/m124w16e1.pdf
Problem 3 from: http://www.math.washington.edu/~aloveles/Math124Winter2016/m124w13e1.pdf
Problem 4 from: http://www.math.washington.edu/~aloveles/Math124Winter2016/exam1v1.pdf
Problem 6 from: http://www.math.washington.edu/~aloveles/Math124Winter2016/exam1v1.pdf
Problem 3 from: http://www.math.washington.edu/~aloveles/Math124Winter2016/nichifor2011.pdf
Problem 5 from: http://www.math.washington.edu/~aloveles/Math124Winter2016/m124w13e1.pdf
Problem 4 from: http://www.math.washington.edu/~m124/source/Exams/Midterm1/mid1w11/midterm1v1.pdf
Problem 2c from: http://www.math.washington.edu/~m124/source/Exams/Midterm1/2015aut/pezzoli.pdf

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 was my studying strategy that seemed to work so well for me:

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. Try to look through 5 exams in 15 minutes and make notes of things that confuse you to come back to later.
   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, reading 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.

Dr. Andy Loveless