

## Math 124 End of Week 1 Newsletter

Every Friday, I will email the class or post a newsletter. These newsletters and emails will contain a summary of the calendar, information about homework, links to review material and studying advice. The studying advice will include old exam problems to look at each week. **It is vital that you spend some time each week reviewing homework and practice your homework skills on similar old exam problems.** If you find something helpful here, please advertise to your classmates.

### UPCOMING SCHEDULE:

Friday: Section 10.1 / 2.1 (introduction to limits and notation)  
Monday: Section 2.2/2.3 (limits using algebra)  
Tuesday: Limits and Graphs Worksheet:  
[http://www.math.washington.edu/~m124/source/worksheets/aut\\_ws2.pdf](http://www.math.washington.edu/~m124/source/worksheets/aut_ws2.pdf)  
Wednesday: Section 2.5 (Continuity)  
Thursday: Homework discussion and test prep (bring homework questions!)  
Friday: Section 2.6 (Limits at Infinity)

**GENERAL DEPARTMENTAL COURSE MATERIALS:** Remember that all general course information, worksheets solutions, calculator policies, *etc* can be found on the department's course website: <http://www.math.washington.edu/~m124/>  
In particular, worksheet 1 solutions: [http://www.math.washington.edu/~m124/source/worksheets/aut\\_ws1sol.pdf](http://www.math.washington.edu/~m124/source/worksheets/aut_ws1sol.pdf)

### HOMEWORK:

Closing Mon at 11:00pm: hw01S10.1  
Closing Wed at 11:00pm: hw02S2.1  
Closing Fri at 11:00pm: hw03S2.2

### HOMEWORK HINTS:

**You should always read through ALL the homework as soon as it become visible so that you can familiarize yourself with all the problems and immediately ask if you have questions about how to start a problem.** In most assignments this quarter, there will be several applied or supplemental problems for you to practice, review, and apply what you know. It is smart to read these applied problems as soon as you can and make sure you ask if you have set up questions. Since this is a big week of homework, I am going to give several hints to get you started, I won't typically do this:

**Important accuracy note:** Keep **ALL** your digits until the very end of the problem. (Do NOT round to two digits in the first step, that would give you a very inaccurate answer in the end). Only round in the very last step!

*Section 10.1: Problems 1 and 2 Hints:* Involve circles and tangent lines. You will use what we discuss in lecture and what you do in quiz section. The key idea is that the "radial" line is always perpendicular to the "tangent" line. In problem 2, start by labeling the unknown point of tangency as  $(a,b)$ , then write down what you know about  $(a,b)$ . It is on the circle and the slope at this point is the negative reciprocal of the slope of the radial line. Set this up and solve for  $a$  and  $b$ . This is a good one to ask about in quiz section of the MSC.

*Section 10.1: Problem 3 Hints:* Plot points. Meaning What are  $(x,y)$  when  $t = 0$ ? .. at  $t = \pi/4$ ?... at  $t = \pi/2$ ? etc... Which plot goes through these points? The "paths" that you see clearly intersect in two points. They only "collide" if these intersections occur at the same time (i.e. the same value of  $t$ ).

*Section 10.1: Problem 4 Hints:* This should be quick. Make sure to type in a "list of equations" which means you will type in something like:  $x = 1 + 4t$ ,  $y = 2 + 3t$  (you will type in something just like this including the " $x = \dots$ ,  $y = \dots$ "). This problem is just showing you how to set up linear parametric equations as we briefly discussed in lecture the first day.

*Section 10.1: Problem 5 Hints:* Part (a) is just like problems 1 and 2 (tangents!). For the rest of the problem, note that they give you the  $x$  and  $y$  equations for the ant:  $x(t) = \cos(\pi t)$ ,  $y(t) = \sin(\pi t)$ . (Another example of circular motion). Now it becomes a trig solving problem. If you don't remember how to solve with trig, then there are examples in my review here:

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124PrecalcQuiz.pdf>

*Section 10.1: Problem 6 Hints:* Follow the instructions. In part (b), you are finding the intersection of the parabola  $y = 2x^2 - 4x + 1$  and the line from part (a). When you try to find this intersection and rearrange the resulting equation you get something that can be written as  $2x^2 + bx + c = 0$  (and in place of  $b$  and  $c$  you will have expressions that involve  $m$ ). For part (c), write out the quadratic formula and make appropriate conclusions.

*Section 2.1: Problem 5 Hints:* Remember the distance formula between two points:  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$   
In this problem the ladder is always exactly 25 feet long (so the distance between the top and bottom will always be 25).  
*Section 2.1: Problem 6 Hints:* This is a standard circle intersecting a line question from precalculus. Read my examples online if you don't remember how to find equations for circles and lines.

*Section 2.1: Problem 7, 8 Hints:* Circular motion problems. Start by reading all of section 22.5 from this:

<http://www.math.washington.edu/~m124/source/supps/paraeqns1.pdf>

For more examples, read these problems from old precalculus finals (solutions included):

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Precalc%20-%20Parametric%20Circular%20Motion.pdf>

*Section 2.2: Problems 13:* Most of your answers will involve the symbol "r", you are working in general. Simplify as you go! The problem is much harder if you leave part (a) in a messy form.

## NEW POSTINGS

Remember the course website is here: <http://www.math.washington.edu/~aloveles/Math124Winter2017/index.html>

There are several new postings:

1. **Week 1 Overview (contains a basic review for 10.1, 2.1, and 2.2):**

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124week1review.pdf>

2. **Unit circle and basic trig review:**

<http://www.math.washington.edu/~aloveles/Math120Fall2011/Overview%20of%20Trigonometric%20Functions.pdf>

3. **General Brief Intro to Parametric Equations:**

Read all of section 22.5 for a review of circular motion:

<http://www.math.washington.edu/~m124/source/supps/paraeqns1.pdf>

Read all of this for a review of linear motion:

<http://www.math.washington.edu/~m124/source/supps/paraeqns2.pdf>

4. **Full Precalc Review Sheet:**

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124PrecalcReview.pdf>

**Abbreviated Precalc Review (for first week):**

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124PrecalcQuiz.pdf>

## SUPPLEMENTAL POSTING

Old Final Questions (with solutions) from our precalculus course (see these for more examples)

1. Line and Circle Intersection Problems:

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Precalc%20-%20Circles%20&%20Lines%20Intersection.pdf>

2. Functional Notation Problems (read this before will help with 2.3, 2.5, 2.6 and 2.7):

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Precalc%20-%20Functional%20Notation%20&%20Multipart.pdf>

3. Parametric Linear Motion:

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Precalc%20-%20Parametric%20Linear%20Motion.pdf>

4. Parametric Circular Motion:

<http://www.math.washington.edu/~aloveles/Math124Winter2017/m124%20Precalc%20-%20Parametric%20Circular%20Motion.pdf>

## OLD EXAMS:

Most weeks, I will also email you links to a few old exams just to encourage you to start accessing yourself on how ready you are for the exams. There are many old exams (most with solutions) in the departmental exam archive here:

<http://www.math.washington.edu/~m126/midterms/midterm1.php>

and in my additional exam archive here:

<http://www.math.washington.edu/~aloveles/Math124Winter2017/LovelessExamArchive.html>

(you probably should just ignore the exams marked honors unless you want an extra big challenge).

## Here are introductory limit problems (2.1, 2.2) from old midterms:

Problem 5 from (we will know how to do (a)(b)(c) by next week, we won't know (d) for a few weeks)

<http://www.math.washington.edu/~m124/source/Exams/Midterm1/2015aut/ostroff.pdf>

## Here are a circular motion problems from an old tests:

Problem 6a from: <http://www.math.washington.edu/~m124/source/Exams/Midterm1/mid1w09/alexMidterm1v1.pdf>

Problem 5 from: <http://www.math.washington.edu/~m124/source/Exams/Midterm1/2015aut/koblitz.pdf>

## For your own interest (not required):

For fun/motivation, you can read some of my old honors exams (these are more challenging than our exam will be). But these exams often have large applied problems, so they should give you good idea of some of the applications you can do with the material we are learning. And most of them involve dropping water balloons on your instructor.

So, **just for your own interest**, and when you have a free few minutes, read through these old exam questions from my Math 124 Honor class (you don't yet have the skills to do these problems, but by the end of the term these are all problems you could do):

Check out problem 5 from: <http://www.math.washington.edu/~aloveles/Math124Winter2016/m124f12e1.pdf>

Check out problems 3 and 5 from: <http://www.math.washington.edu/~aloveles/Math124Winter2016/m124f11e1.pdf>

Check out problem 6 from: <http://www.math.washington.edu/~aloveles/Math124Winter2016/m124f10exam1.pdf>

Check out problem 5 from: <http://www.math.washington.edu/~aloveles/Math124Winter2016/m124f12e2.pdf>

Check out problem 6 from (this is a ferris wheel problem, so the first part of it is like HW):

<http://www.math.washington.edu/~aloveles/Math124Winter2016/f11m124e2.pdf>

Check out problem 6 from: <http://www.math.washington.edu/~aloveles/Math124Winter2016/m124f10e2.pdf>

## IMPORTANT HOMEWORK COMMENTS:

There are NO homework extensions for any reason! You should be activity working on the homework as we discuss the material in lecture. The "closing dates" for the homework are typically 2-3 days later than they need to be just to give you plenty of breathing room, but you should always plan to complete the assignments at least 2 days before they are due to in case of emergency (because remember, you won't be granted an extensions for any reason). Also remember the goal of the homework is to give you practice with the material you can master it. If you miss one homework assignment or if you miss a few problems on a homework assignment, those points won't hurt your grade in any measurable way. BUT if you don't know the material for the exams and perform poorly on the exams, that will hurt your grade a lot. **At the end of the term, I round up your homework grade by 5% so you can miss a little homework and still get 100%** (anyone that gets 95% or above will get 100% for homework, for everyone else I will add 5% to their homework grade at the end of the term).

## How to Approach Homework:

1. Don't move on until you completely understand the problem (Could you do a similar problem on a test?).
2. Always get it right in one submission. **At most you should be using 2 submissions** (in case you have a typo in your first answer). DON'T use webassign to check your work and don't just guess. Practice checking your own answers. If you solved an equation, then you can check your answer by seeing that works in the equation!

Always check your last step against your first step. If you think you are just mistyping something, don't use 5 submissions typing the same thing in five different ways.

3. If you still don't have the answer after 2 submissions, then bring your question to quiz sections, office hours, the MSC, etc... You should never, ever, ever use more than 3 submissions (you are generously given 5 submissions, which you should never use up).

**Remember you only get one submission on the test!**

4. Treat every problem like it is a test. Don't rush through the homework (the goal is not to finish quickly, the goal is to learn the material). At the end of each assignment go back and review the material. Take notes of things that stumped you and come talk to me or a tutor to clarify those issues. Also start making a review sheet of things that might help you if you see the same problem again (remember you get a sheet of notes on the exam, so you should start making now as you do the homework).
5. At least once a week, go take a peek in the exam archive. See which problems you can do and which problems look like problems from the homework. In this way, you will start to see a direct connection between homework and tests.

**GETTING HELP:** If you need help, here is what you need to do.

1. Start your homework early so that you have time to get help (if you email me the night the homework is due, you won't get a reply). So start the homework at least 5 or 6 days before it is due and always finish it at least two days before the closing date.
2. Quiz section: Your first and best place to ask is in quiz section.
3. Math Study Center (MSC): The Math Study Center is your best place to get some extra help. It is located in Communications B-014 It will be open Mondays-Thursdays from 9:30am to 9:30pm as well as Friday 9:30-1:30 and Sunday 11:00-6:00. Come on by! This is staffed by Math Department grad students and undergraduate tutors that we have hired.
4. Office hours: You can also visit my posted office hours (there are many). See the course website.
5. CLUE: Sundays-Thursdays in the evenings from 7:00-midnight there is drop in tutoring in Mary Gates Hall (Commons). This is staffed by general undergraduate tutors. Check it out.
6. Study groups: You can and should form study groups with classmates. That is a good way to get help. Just remember that you need to keep asking yourself if you could do the problem on your own on an exam!
7. Email: If you have tried all other helping options and are still stumped, you can send me an email ([aloveles@uw.edu](mailto:aloveles@uw.edu)), but use this as a last resort.

**STUDY TIP:**

Treat the homework as if it were an exam! Use one submission as much as possible (you only get one submission on exam questions) and avoid using the "Watch It" and "Practice another version" (those also aren't available during the exam). After the homework due date passes, you can go back and see the answers and solutions. Make sure to do this. It is a good use of 10 minutes to go back through the homework set and look at the solutions to make sure you really do understand all the concepts. Make some notes to yourself about problems to come back and review again in a week. It's nice to review each assignment right after you finish it and again a week or two later. In the upper right corner of each problem you see where the problem came from in the book, so if you want more practice, then go to the book and try other problems that are nearby the problem you are having difficulty with.

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