Modern Algebra
MATH 325W – Spring 2015

Wednesday:	Chapter 1: Preliminaries (WOP, division algorithm)
Friday:	Chapter 1: Preliminaries (division algorithm, GCD, FTa)
Monday:	Chapter 1: Mathematical Induction
Wednesday:	Chapter 1: Mathematical Induction
Friday:	Chapter 3: Complex Numbers (arguments and angles)

Homework #1 **due Friday, January 23**

Ch. 1: #33, 34, 35 (Counterexample or *short* justification. Use full sentences!)

LaTeX: Everyone should do the first step below. The remaining steps are then to be done as a team.

(1) Go to https://www.sharelatex.com/ and sign up for an account
(2) **Team Member 1:** In a new window, go here to get a LaTeX template:
https://www.sharelatex.com/project/54bea727838dbf4542f54fb7
(3) **Team Member 1:** Click on the menu icon (upper-left corner - 3 horizontal lines); select "Copy Project"
(4) **Team Member 1:** When prompted for a name, choose something like "Modern Algebra - Assignment - 0" and click "Copy"
(5) **Team Member 1:** When this completes you will be back in your own workspace (instead of mine). The LaTeX source is on the left, and the pdf output is on the right. Look over the LaTeX code. Much of it may seem mysterious right now, but some of it will make sense.
(6) **Team Member 1:** Edit the LaTeX code so that you and your team member are the authors and so that the date reflects the due date of this assignment. Press the "Recompile" button if you are impatient like me.
(7) **Team Member 1:** Edit the LaTeX code so that the body of the document begins "Hi Josh, it's ⟨insert name⟩. Did you know that ⟨insert super interesting story about yourself⟩." Press the "Recompile" button, and make sure that the pdf looks beautiful.
(8) **Team Member 1:** Click on the share icon (upper-right - 5 headed beast). Enter your team member's email address, make sure they "can edit" it, and "Share."
(9) **Team Member 2:** Check your email, and find the invitation to join the project. Click on "View Project" in the email. You should be taken into your own account, and you should be able to see the shared project.
(10) **Team Member 2:** Go into the project. Add a new paragraph to the body of the document that starts, "Hi Josh, it's ⟨insert name⟩. Did you know that ⟨insert super interesting story about yourself⟩." "Recompile."
(11) **Team Member 2:** Click on the download pdf button (second one to the right of the "Recompile" button.
(12) **Team Member 2:** Email the beautiful pdf to me at jwiscons@hamilton.edu

Homework #2 **due Wednesday, January 28 ~~due Tuesday, January 27~~**

Ch. 1: #4, 6, 8 (Read Example 1.7 first)

Ch. 3: Read/review pages 34–40 (stop at Prop 3.5). Do #1, 3, 11, 13. I realize we haven't started Chapter 3 in class yet. This should be review.

LaTeX: Go here to view the "Modern Algebra - Assignment Template And Learning LaTeX" project:

https://www.sharelatex.com/project/54beb831838dbf4542f550fd

Read through the pdf and compare with the LaTeX source. Feel free to copy it to your workspace if you want. There is nothing to turn in for this.

Homework #3 **due Friday, January 30**

Ch. 3: #2, 6, 32 (for #32, plug proposed solutions into $x^2 + x + 1$ and show that the result is zero)

On writing assignments, part of your grade will reflect the quality of your ***style***. Style includes everything from the basic mechanics of writing (complete, grammatically correct sentences with capitalization and proper punctuation) to the conventions of writing mathematics developed in Linear Algebra.

Writing Assignment #1 **due Friday, January 30 ~~due Wednesday, January 28~~**

Ch. 1: #32, 24, 40
Remember what you read in the "Modern Algebra - Assignment Template And Learning LaTeX" document. For this assignment, you may want to use the following project as a template.

https://www.sharelatex.com/project/54beb86e838dbf4542f55107

PCtM: Read Section II.3.6, "The Search for the Roots of Algebraic Equations," in the *Princeton Companion to Mathematics*. This can be found through the Hamilton College Library. Write a short summary (somewhere around 2-3 paragraphs) of Gauss's work on determining for what values of n it is possible to find the roots of an arbitrary n-degree polynomial:

- Start by briefly summarizing the problem with finding roots and previous attempts.
- Summarize Gauss's contribution(s).
- Describe any questions you have about the reading that the text did not address (but that you hope our mathematical inquiry in this class might address).

The reading is thought-provoking, so the last item shouldn't be very difficult!