MATH 267 Fall 2026 - Class Notes

8/24/2026

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Summary: Today, we covered an overview of the course structure and syllabus. We did a warm-up on incorrect definitions and providing a counterargument. We began defining vocabulary terms and concepts that we will rely on throughout the course. Finally, we looked at some algebraic proofs.

Notes: Some important things to remember about the course:

- Purchase the textbook Reading, Writing, and Proving: A Closer Look at Mathematics by Pamela Gorkin and Ulrich Daepp.
- There will be a reading reflection in Overleaf, due at midnight before each class.
- Sign up to take LaTex course notes for two dates.
- https://tigerweb.towson.edu/nmcnew/m267f26/ holds the syllabus and schedule!
- Polya's Problem Solving Strategy: Understand the problem, devise a plan, carry out the plan, and look back at your problem/solution.

Definitions:

Definition 1. *Definition: Giving a rigorous mathematical definition to an English word (The English intuitive definition no longer has use for us). Primitive words are left undefined (Element, set, integer, etc.) Concepts that we'll assume we all agree on.*

Definition 2. *Theorems: Statements that can be proven true from other theorems and definitions. Sometimes called Lemmas or Propositions.*

Definition 3. *Axioms: True statements that we assume without a proof.*

Definition 4. *The set of natural numbers, $\mathbb{N}$, is all integers greater than or equal to 0.* $\mathbb{N} = 0, 1, 2, 3...$

The set of integers, $\mathbb{Z} = 0, \pm 1, \pm 2...$

Theorems and Proofs:

Theorem 1. *If a and b are integers, we say that a divides b and write $a|b$ if $b = aq$ for some integer q.*

Proof. Let a = However, looking at $0|0$, we determine $0 = 0 * q$, where q could be any number. We know we cannot divide by 0, and discussed this as a case for being very careful with definitions. Adjusting the definition to require a unique value of q would fix this issue. □

Theorem 2. *An integer $n > 1$ is reducible if we can write $n=a*b$ for two integers a,b with $1<a\leq b$. If $n > 1$ is not reducible, it is irreducible.*

Proof. Looking at the number 6, $6 = 2 * 3$. Therefore, six is reducible. Looking at the number 7, 7 is not equal to any a,b that meet the criteria of $1<a\leq b$. Therefore, 7 is irreducible. □

Questions raised in class: We did not have any unresolved questions today. We ended on the 100 locker problem, where they all begin closed and the K-th student flips every k-th locker, starting with locker k. Which lockers are open at the end? We will revisit this on Wednesday.