MATH 267: READING REFLECTIONS GUIDE
FALL 2026

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1. Overview

Reading reflections are short assignments designed to get you engaging actively with the textbook *before* each class. You will complete them in a shared Overleaf project, which doubles as practice for the typed course notes you will produce later in the term.

The reflections are not busywork and they are not a reading quiz. They exist because reading mathematics is a skill that has to be practised deliberately, and because your questions shape what we spend class time on. I read every one before class, and you will regularly hear your own questions answered by name in the first ten minutes of the period.

2. The RAW Format

Each reflection has three parts.

- **Read.** Choose one definition or theorem from the assigned reading and take it apart. What is each condition or clause doing? Why is it stated this way rather than some simpler way you might have expected? What would go wrong if one of the conditions were dropped?
- **Analyze.** Construct your own example illustrating a definition or result from the reading, using proper mathematical notation. It should be your example, not one copied from the text.
- **Wonder.** Ask one specific question about the material.

Three to five sentences per part is right — roughly 200 words in total.

3. What the "Read" Part Is Really Asking

This is the part students find unfamiliar, so it is worth being precise about.

It is entirely possible to read a definition, follow every word of it, and still not understand what it is for. The remedy is to stop and ask yourself: *why is each piece of this here, and what would break without it?* Answering that question in writing is called **self-explanation**, and it is the best-studied technique there is for getting more out of reading mathematics.

Two things that look like self-explanation but are not. Suppose the definition is:

> *Let a and b be integers. We say a **divides** b, written $a \mid b$, if there exists an integer k such that $b = ak$.*

A **paraphrase** restates it in different words:

> "$a \mid b$ means that b is a times some integer."

Monitoring reports whether you followed it:

> "Okay, I understand this definition."

Neither adds anything. A **self-explanation** asks what the pieces are doing:

> "The load-bearing word is *integer*. If k were allowed to be any real number the definition would be useless, since every b would be divisible by every nonzero a — for instance $7 = 3 \cdot \frac{7}{3}$. Requiring $k \in \mathbb{Z}$ is what makes $3 \nmid 7$ true. I also noticed the

> definition never mentions division or fractions at all; it is stated entirely in terms of multiplication. That must be why $a \mid b$ still makes sense when $a = 0$, where dividing by a would not."

If your Read section could be written by someone who had not understood the reading, it is a paraphrase. We will practise this together in class on September 9, where we extend the same move to individual lines of a proof.

4. Logistics

- **Due:** 11:59pm the night before each class that introduces new material — so most Sunday and Tuesday nights.
- **Length:** 3–5 sentences per part, about 200 words total.
- **Platform:** your individual Overleaf project, shared with me.
- **Feedback:** I comment directly in your Overleaf document.

5. Getting Started with Overleaf

5.1. First time setup.

(1) Create a free Overleaf account at overleaf.com.
(2) Check your Towson email for a shared project invitation.
(3) Accept the invitation to open your personal reflection document.
(4) Have a look around the interface — see the resources at the end of this guide.

5.2. Each time.

(1) Read the assigned chapter, with paper and pencil at hand.
(2) Open your Overleaf document and find the section for that class meeting.
(3) Write the three parts.
(4) Click "Recompile" and check that the PDF looks the way you intended.

6. An Example

The reflection below is on Chapter 2, the reading for your first reflection, due Tuesday, August 25.

Reading: Chapter 2. The definition under discussion:

> **Definition.** Let P and Q be statements. The **implication** $P \to Q$ is the statement that is false when P is true and Q is false, and true in every other case.

Read. I chose this because the phrase "true in every other case" looked wrong to me. It means that whenever P is false, $P \to Q$ counts as true no matter what Q says, so "if $2 = 3$, then the moon is made of cheese" is a true statement.

Taking the definition apart: it never says that P causes Q, or that the two are even about related things. The only combination it rules out is a true P with a false Q. So $P \to Q$ is really a promise, and a promise can only be broken once its condition is actually met.

What would break if we changed it? If we instead called $P \to Q$ false whenever P is false, then "for every integer n, if $n > 10$ then $n > 5$" would come out false, since $n = 3$ has a false hypothesis. But that statement ought to be true. So the convention is not arbitrary — it is what makes quantified implications behave.

Analyze. Let n be an integer, and let P be "$4 \mid n$" and Q be "n is even." Taking $n = 12$ makes both true, so $P \to Q$ is true. Taking $n = 6$ makes P false and Q true, and $n = 7$ makes both false; the definition calls $P \to Q$ true in each of those cases. No integer makes P true while Q is false, since $n = 4k$ gives $n = 2(2k)$. So "if $4 \mid n$ then n is even" is true for every integer n, and I have now used three of the four rows of the truth table on one example.

Wonder. Making $P \to Q$ true whenever P is false feels like it throws information away — the statement about the moon tells me nothing. Is there a version of logic that treats such a sentence as neither true nor false, and if so, is there a reason mathematicians do not use it?

7. Grading

Each reflection is worth 2 points.

- **2/2:** All three parts present. The Read section genuinely takes the statement apart rather than restating it; the example in Analyze is your own.
- **1.5/2:** All three parts present, with minor gaps — for instance a Read section that slides into paraphrase near the end.
- **1/2:** A part is missing, or the Read section is entirely paraphrase or monitoring.
- **0/2:** Not submitted by the deadline, or off-topic.

Late reflections receive reduced credit. The deadline is the night before class because the whole point is that I read them *before* I teach.

8. LaTeX for This Course

8.1. Symbols you will need.

- Number systems: `\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}` give $\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$
- Divides: `a \mid b` and `a \nmid b` give $a \mid b$ and $a \nmid b$
- Set membership: `x \in A`, `x \notin A` give $x \in A$, $x \notin A$
- Subsets: `A \subseteq B` gives $A \subseteq B$
- Operations: `A \cup B`, `A \cap B` give $A \cup B$, $A \cap B$
- Set-builder: `\{x \in \mathbb{R} : x > 0\}` gives $\{x \in \mathbb{R} : x > 0\}$
- Connectives: `\neg P`, `P \wedge Q`, `P \vee Q` give $\neg P$, $P \wedge Q$, $P \vee Q$
- Implication: `P \to Q` and `P \leftrightarrow Q` give $P \to Q$ and $P \leftrightarrow Q$
- Quantifiers: `\forall x \in A`, `\exists x \in A` give $\forall x \in A$, $\exists x \in A$
- End of proof: `\square` gives $\square$

8.2. Math mode.

- Inline: `$x + y = z$` gives $x + y = z$.
- Displayed: `\[x + y = z\]` puts the expression on its own centred line.
- Note that `\{` and `\}` are needed for braces — a bare `{` will not print.

9. Reading Strategies

- Read with paper and pencil. Mathematics does not go in through the eyes alone.
- Work the examples before you read the proofs.
- When a proof stalls you, try the statement on a small case first — often the smallest and stupidest case available.
- Do not expect to understand everything on a first pass. Nobody does. Note where you stopped understanding and put that in your Wonder section; that is exactly the information I want.

10. Frequently Asked Questions

Q: What if I did not understand the reading at all?
A: That is useful information and it still earns full credit. Explain as far as you got, say precisely where you lost the thread, and make that your Wonder question. "I don't get it" is not a question; "I don't see why the definition makes $P \to Q$ true when P is false" is.

Q: Can I work with a classmate?
A: Discuss the reading as much as you like. The writing must be your own, and the example in your Analyze section must be one you constructed.

Q: What if I can't access my Overleaf project?
A: Check your Towson email for the invitation first, then email me.

Q: What if my LaTeX does not compile?
A: Submit what you have and note the problem. Debugging LaTeX is part of what you are learning here, and errors cost you nothing on these assignments.

Q: May I use AI tools to write my reflections?
A: No. See the course policy: reflections are specifically designed to assess your own engagement with the reading, and a generated reflection tells me nothing about what you need. You may use AI tools for LaTeX formatting questions.

11. Why We Do This

(1) **Reading is a skill.** Self-explanation is the difference between students who can learn from a mathematics text and students who cannot.
(2) **Your questions steer the class.** The first ten minutes of most meetings come straight from the Wonder sections.
(3) **LaTeX practice** for the typed course notes you will produce later.
(4) **Preparation.** Class is the second pass at the material, not the first.

12. Resources

- Learn LaTeX in 30 minutes
- Greek letters and math symbols reference
- Office hours: Mondays 2:30–3:30 and Fridays 11:00–12:00, or by appointment.