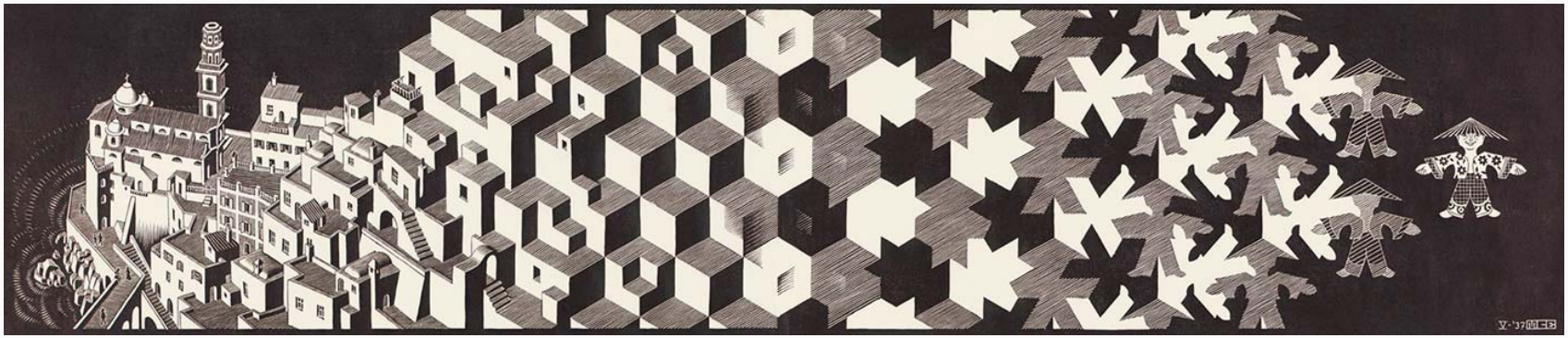

Transition to Advanced Mathematics

Math 215

Fall 2021

The College of Wooster

"The History of every major Galactic Civilization tends to pass through three distinct and recognizable phases, those of Survival, Inquiry and Sophistication, otherwise known as the How, Why, and Where phases. For instance, the first phase is characterized by the question 'How can we eat?' the second by the question 'Why do we eat?' and the third by the question 'Where shall we have lunch?"

About Me

- Name and Pronouns: Prof./Dr. Subhadip Chowdhury (he/him/his)
- Website: *subhadipchowdhury.github.io*
- Studied Math at the *Indian Statistical Institute* and the *University of Chicago*.
- My Research: Predict long term dynamical behavior of composition of functions on a circle, given limited information about their action.

What is Mathematics?

- a science - systematically organized body of knowledge on a particular area.
- a cornerstone of all physical sciences and technology.
- an art form - (Merriam-Webster)

  > *"something that is created with imagination and skill and that is beautiful or that expresses important ideas or feelings"*

- arguably the hardest academic discipline known to mankind that requires more dedication than most others.

Math Teaches us:

- *mental discipline*.
- how to reason logically.
- how to think with precision.
- how to construct precise arguments - known as **proofs**, and used to establish facts, known as **theorems**.

An Example

Like every other specialization, what mathematicians find *'interesting'* may be of completely no interest to the average person.

- (Goldbach, **1742**) Is every even integer greater than **2** the sum of two prime numbers?
- has been checked to be true for all even integers up to 4×10^{14}.

Even if all mathematicians are not actively working to prove this, all of us are *bothered* by the fact that it is so simple to state, yet beyond our current ability to solve!

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> “The best way to learn is to do; the worst way to teach is to talk.”
> –Paul Halmos

This course requires your active participation!

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- Don't be afraid to ask questions and make mistakes!
- There are many ways to solve the problems in the course, but solutions will not usually come easily.
- Communicating mathematics is hard; it takes practice!

Fostering an Inclusive Classroom

In our classroom, diversity and individual differences are respected, appreciated, and recognized as a source of strength. Students are encouraged and expected to participate in the course, to show respect towards one another, and to listen to each other carefully.

In summary: Be good to each other.

Let's talk Syllabus

Components of the course:

- Weekly Homework
- Learning LaTeX
- Practically Perfect Proofs aka P^3
- Writing and presenting an expository paper
- Three quizzes including a final
- Daily Active Participation

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Before our class on Friday:

- Read the syllabus and the assessment documents from Moodle and the introduction section from the 'lecture notes'.
- Complete Reflection Task 1.

How should we work together?

In a moment, we will start working on the first worksheet in groups of four. As you work together, try using the language from the "Group Discussion Frames" pdf document in Moodle to facilitate your discussion.

After you finish working, go to MS Teams, find the "Collaboration Space" word document and fill out some comments. In the future,

- What is something you want your group members to do?
- What is something you do not want your group members to do?
- What is something you want Dr. Chowdhury to do or not do?