This week, we need to investigate some Measure Theory! Specifically, we need to see the construction of a non-measurable set.

Again, I would like to see your proofs and hear your ideas ideas on Thursday. We can discuss any questions you have, too. It is OK to come with lots of ideas and questions, but no finished proofs. Try to get as far as you can in the time you have.

0.1 Non-measurable Sets and Vitali Sets

1. First, watch this video. It is very good. It is "Lecture 01: Introduction: a non-measurable set" by the Instituto de Matemtica Pura e Aplicada.
   https://www.youtube.com/watch?v=llnNaRzuvd4

2. If you want a written source, you can read along with these PDFs. The last one is very short.

   - https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781118032732.app2
   - https://www.math.purdue.edu/ zhang24/NonMeasurableSet.pdf

0.2 From the Book

1. Read the first paragraph of the Preface in the book.

2. Read Theorem 1.5. SO_2 is the group of rotations of the circle.

3. Read Corollary 1.6.

0.3 Things to Present

I would like you to present either,

1. The construction of a non-measurable set,

2. The proof of Theorem 1.5, or,

3. The proofs of Theorem 1.5 and Corollary 1.6.

The choice is up to you, depending on how far you get. But I want to see all the details. Please feel free to make your own notes and refer to them as you present. But, I would like you to make your own notes, instead of reading from the book or a printed out PDF.