0.1 The Banach-Tarski Paradox

This week, we see the Banach-Tarski Paradox!

1. Theorem 1.10 in the book. Understanding this theorem is very, very important. It is the foundation of all the paradoxes to come. It may be helpful to read some of the discussion before and after Theorem 1.10 in the book, just to provide context.

2. Theorem 2.3. The proof for this is in the discussion before the actual theorem. If begins at the paragraph, "Each element of the free group of rotations..."

0.2 To write up

As we talked about, just to clarify it for yourself, write up all the details – every step – of the proof of the Hausdorff Paradox. For every claim you make (except that you have two rotations which generate a free group in SO_3) make sure that you can prove it with no gaps.

0.3 The Banach-Tarski Paradox

You will need to read the following sections, and ALL of their surrounding discussion.

1. Definition 3.1

2. Defintion 3.3

3. Proposition 3.4

4. Theorem 3.5

5. Corollary 3.6

6. Theorem 3.9

With these, we can begin reading Corollary 3.10 (the Banach-Tarski paradox).

0.4 To Present

This week, present on what you learned. However far you get, I would like to see what you do. So, Theorem 3.5, Corollary 3.6, Theorem 3.9, are all good.

If you get to the proof of Corollary 3.10, I want to see the full proof, with all the details.

As usual, just do your best. It is OK to come to the meeting and say, I understood these things, but this, this, and that were confusing.