

## Discussing Infinity Project

This project has three steps: **writing down your thoughts** on infinity, **having a mathematical conversation** with someone and **reflecting on it**.

### Gathering your thoughts

Before you sit down to discuss infinity, take some time to reflect on what key points you want to get across and what your friend might find exciting or enjoyable in the conversation. Write an outline of the narrative you plan on telling. You might find it helpful to write out in full English sentences any particularly technical things you want to explain. You will almost certainly need at least one diagram to help clarify your narrative. You might want to reference our book or the videos I sent out as you clarify your thoughts. I would spend at least half an hour on this step. You will submit these notes along with your reflection.

### A conversation with a friend

Find a friend, classmate, family member, who is willing to sit down with you for a while and talk about math. Your goal is to tell them about how there are different sizes of infinity. This probably involves talking about countable infinity and one-to-one correspondences and then eventually the diagonal proof to show that the whole number can't be matched up with the reals. I would encourage you to have something to write on, both to facilitate your explanations and so you have a record of the conversation to remind you what happened.

But you don't have to explain it like we did in class. Feel free to discuss this any way you want or think would be most engaging. The main goal is that you are trying to convey a mathematical idea of infinity. Don't shy away from trying to be precise about your definition of two infinities being the same size. Your conversation could also take you other places too, especially if you can get your partner to ask some of their own questions. Perhaps you find yourselves talking about what it means to prove something or you find yourselves discussing fractals. Perhaps you both end up confused – that's OK. Have fun with it and bravely discuss math!

### Reflection

The last part of the assignment is for you to write a narrative of this experience. Keep notes during your discussion in order to help you remember what transpired (or write this reflection very soon after the conversation). Your narrative should include:

- a description of what transpired in your interaction (i.e., what did you discuss?);
- how you and your friend reacted to the whole process;

You might emphasize which parts of the discussion were most challenging, or the moments when ideas fell into place. You might also emphasize what was fun or what felt difficult. Did anything surprise you in your conversation? How did it feel to be the expert mathematician in the conversation?

### Putting it together

Put your preparatory work and your reflection together and upload them to your google drive folder.