

Midterm Preparation for MATH 497A, Introduction to Ramsey Theory

Definitions and Theorems

Review the definitions and theorems covered so far. You will be asked to state a few of them precisely.

Theorem from Class

You will be asked to state and prove one or two of the following theorems:

- The finite Ramsey Theorem for graphs
- The infinite Ramsey Theorem for pairs of natural numbers
- Turan's Theorem
- Cantor's Diagonal Argument
- The Axiom of Choice implies Zorn's Lemma and the Well-ordering Principle
- The existence of a non-Lebesgue measurable set.
- The (simple) Erdős-Rado Theorem
- König's Lemma

Examples

In this part you will be asked to produce a couple of examples, for instance:

- Explicitly define a countable set S of real numbers so that if we restrict the standard order $<_{\mathbb{R}}$ to S , we obtain a well-order of order type ω^3 .
- An \mathbb{N} -coloring of $[\mathbb{R}]^2$ with no homogeneous subset of size 3.

Two New Problems

- One is going to be a simple application of Ramsey's Theorem to a different setting, like Homework 1, #1.
- Another one is going to be an application of one of the other theorems listed in #2.