

Exam: Advanced Topics in Set Theory

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1. Prove that for any set X of the plane R^2 there is a measurable set A containing X such that whenever $Z \subseteq A - X$ is measurable, then Z is null.
2. Prove that every analytic set of reals is Lebesgue measurable.
3. Prove that the Axiom of Choice is not compatible with the Axiom of Determinacy.
4. Define the Banach-Mazur game.
5. Prove that the Axiom of Determinacy implies that \aleph_1 is measurable.