Math 455, Winter 2020

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Borel-Cantelli problem set

Due date to be announced

This (extra credit) problem is worth 10 points.

Problem 1 (10 points). Fix $\delta > 0$. Show that the Lebesgue measure of the set of all $x \in [0, 1]$ such that there exist infinitely many pairs of integers (p, q) with $|x - p/q| < 1/q^{2+\delta}$ is equal to zero. **Hint:** use the Borel-Cantelli lemma.