1. Assignment 2

The coin toss experiment has two outcomes, H and T. In the following problems, the experiment consists of repeating the coin toss until the first heads is obtained. The assignment consists of constructing a probability triple (S, Σ, μ) that represents the experiment.

1.1. **Problem 1.** Let S be the set of all possible outcomes of the experiment. Write a definition for S.

1.2. **Problem 2.** Define a σ -algebra Σ on S, that is, a collection Σ of subsets that is closed (stable) under countably many set operations (unions, intersections, and complements).

1.3. **Problem 3.** Define a countably additive set function $\mu : \Sigma \to [0, 1]$ with the property that $\mu(\emptyset) = 0$ and $\mu(S) = 1$.

1.4. **Problem 4.** Let *E* be the event that the coin first comes up heads on an even numbered trial. Find $\mu(E)$.