

Math 20 - Fall 2013

Homework 1

Due September 23, 2013

The generation of random numbers is too important to be left to chance.—Robert R. Coveyou.

Turn in: Exercises 1.2.1, 1.2.6, 1.2.11, 1.2.16, 1.2.20, 1,2,28, 1.2.31, 2.2.2, 2,2,8(a,b,c), 2.2.12 from the textbook, and problem 11 below.

11. In class we looked at the experiment of flipping a coin until we got heads and found the probability that we had to do n flips before getting our first heads. It is conceivable that we might flip the coin forever and it never lands heads, we just get the sequence TTTTTT... (It is an element of our sample space!)

- a What is the probability of this occurring? Why? What does this mean?
- b What is the probability that we flip a coin and get the infinite alternating sequence HTHTHTHT...? (Or a repeating pattern of any length?)
- c Imagine we want to choose a real number at random in the range $[0, 1]$ by picking each digit randomly by rolling a 10 sided die. Let $E \subset [0, 1]$ be the rational numbers (Numbers which can be written as a fraction) in this range. What do you think $P(E)$ is?