

# Math 3215, Homework 1, part 1

August 24, 2011

1. You flip two coins. If the two coins are both heads or both tails, you then roll a die; otherwise, you stop (i.e. you don't roll the die).
  - a. Write down the sample space.
  - b. Assuming that the coin and die are fair, write down the probability of each of the elementary events.
  - c. Let  $E$  be the event that either the first coin was heads or that the number rolled as a 3. Determine the probability of  $E$ .
  - d. Repeat parts b and c, where this time you assume the coin is biased and that it is twice as likely to come up heads as tails. You are to assume the die remains fair.
2. Prove that if  $A_1, \dots, A_k$  are events such that the sum of their probabilities exceeds 1, then they cannot be mutually exclusive.
3. You choose a number at random from 1 to a million. What is the probability that the number is neither divisible by 12 nor by 26?