



Intermediate Math Circles

November 15, 2017

Probability III

Problem Set

1. If you take a bus to work in the morning, there is a 30% chance that you will arrive late. When you go by bicycle there is a 10% chance you will arrive late. 70% of the time you go by bike, and 30% of the time you go by bus. Given that you arrive late, what is the probability that you took the bus?
2. A box contains 4 coins – 3 fair coins and 1 biased coin for which $P(\text{heads}) = 0.6$. A coin is picked at random and tossed 5 times. It shows 3 heads. Find the probability that the coin is fair.
3. At a police spot check, 10% of cars stopped have defective break lights and a faulty muffler. 15% of the cars have a defective break lights, but the muffler was ok. If a car is stopped and has defective break lights, what is the probability that the muffler is also faulty?
4. For one deck building project, a contractor buys 70% of the lumber from supplier A, and 30% of the lumber from supplier B. Typically, 85% of the lumber from supplier A arrived undamaged, while 90% of the lumber from supplier B arrived undamaged. If the contractor pulls one board out and its damaged, what is the probability that the damaged board is from
 - (a) Supplier A?
 - (b) Supplier B?