

Math 36 — Daily Homework

Assigned: 9/20

Due: 9/22

1. (a) Two events A and B are **independent** if the probability of A occurring does not depend on B (i.e.  $P(A|B) = P(A|\neg B) = P(A)$ ) and vice versa. Prove that if A and B are independent, then

$$P(A \cap B) = P(A)P(B).$$

- (b) Suppose you have a random variable X between 0 and 1 with the pdf

$$f(x) = 2x.$$

Describe how X can be used to simulate a coin flip.