

Name: _____

Lecture 31, class activity. Conditional Probability.

- For all of the problems below, we consider the case of flipping three independent coins, so we have

$$\Omega = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\},$$

where all outcomes in Ω are equally likely.

- In each of the following problems, you are asked to find events $A, B \subset \Omega$ with a certain properties, or argue why this cannot happen.

1. $\mathbb{P}(A), \mathbb{P}(B) > 0$ but $\mathbb{P}(A|B) = 0$.

2. $\mathbb{P}(A), \mathbb{P}(B) > 0$ and $0 < \mathbb{P}(A|B) = \mathbb{P}(A)$.

3. $\mathbb{P}(A), \mathbb{P}(B) > 0$ and $\mathbb{P}(A|B) > \mathbb{P}(A)$.

4. $\mathbb{P}(A), \mathbb{P}(B) > 0$ and $\mathbb{P}(A|B) = \mathbb{P}(A)$.