



Conditional probability

- How is the conditional probability that $X = 1$ given $Y = 2$ calculated?
- In introducing this definition I said we needed two functions. Explain in your own words why two functions are required in order to understand conditional probability. What purposes do these functions serve?
- Explain what we mean when we say that a set of subsets are disjoint. Explain why the set of outcomes for which the random variable, X , equals one must be disjoint from the set of outcomes for the set of outcomes for which the random variable X equals 2. Hint: what is the conditional probability $P(X = 1|X = 2)$ equal to?
- The inclusion exclusion principle is an important result in probability theory. It states $P(X = 1 \vee Y = 2) = P(X = 1) + P(Y = 2) - P(X = 1 \wedge Y = 2)$. Explain why this equation holds by drawing a Venn diagram or by considering a finite set.