Data 8 Probability
Fall 2017

Extra Practice

1 Probability

Key Points about Probability

- Assuming all events are equally likely,

$$P(eventA) = \frac{\text{Number of outcomes that make event A happen}}{\text{total number of outcomes}}$$

- If we have two events A and B,

$$P(\text{A and B happening}) = P(\text{A happening}) * P(\text{B happening given A has happened})$$

- If an event can happen exactly one of two different ways, then

$$P(\text{Event}) = P(\text{First way it can happen}) + P(\text{Second way it can happen})$$

- When analyzing if at least one success has happened,

$$P(\text{At least one success}) = 1 - P(\text{zero successes})$$

1. Two six-sided dice are thrown at random.

(a) What is the probability of rolling a sum of 2?

(b) What is the probability of rolling a sum of 5?

(c) What is the probability of rolling the exact same number on each of the dice?

(d) What is the probability of rolling different numbers on each of dice?

(e) Repeat parts b,c, and d for if we were rolling four dice instead of two.

2. Four fair, two-sided coins are thrown at random.

(a) What is the probability of getting all heads, and your third throw is a head?

(b) What is the probability of getting less than 2 heads?

(c) What is the probability of seeing at least three heads?

(d) **Challenge:** What is the probability that we get more heads than tails?