

WORKSHEET 2: CONDITIONAL PROBABILITY

Problem 1. We return to the dice-rolling pirate, Diego. Suppose Diego rolls two dice and then adds the numbers together. The possible outcomes are 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, but recall that these numbers are not all equally likely.

- (a) What is the probability that the sum of the two dice is greater than 4?
- (b) Given that the sum of the dice is greater than 4, what is the probability that Diego's dice added up to 7?
- (c) What is the probability that the dice add up to an even number?
- (d) What is the probability that the dice add up to an odd number?
- (e) Given that the dice add up to an even number, what is the probability that Diego rolled at least one 4?
- (f) Given that Diego's dice sum to 7, what is the probability that he rolled a 3 or a 5?
- (g) What is the probability that at least one of Diego's dice was a 3?
- (h) Given that at least one of Diego's dice was a 3, what is the probability that his dice add up to 8 or 9?
- (i) What is the probability that Diego gets a sum of 4 or 7?
- (j) Suppose Diego keeps rolling the two dice until he gets a sum of either 4 or a 7, at which point he stops. What's the probability that his last roll was 4?

Problem 2. In poker, a **full house** occurs when you get a 3-of-a-kind and a 2-of-a-kind (with a 5-card hand).

- (a) How many possible full houses are there?
- (b) What's the probability of getting a full house?

Problem 3. A vampire goes to the blood bank looking to find some type O+ blood (the most delicious type). He finds four unlabeled bags of blood. Only one of the bags is O+, but the vampire doesn't know which one, so he resorts to taste-testing to find the O+ bag.

- (a) What is the probability that he must test at least 3 bags to find the desired type?
- (b) What's the probability that he must test exactly 3 bags?