

Name:

MATH 320: In-Class 3

Answer all questions. Show your work where necessary.

1. Liam and Michael are going to play video games this afternoon. Together, they have 41 video games. If they decide to randomly choose two video games, what is the probability that the two they choose will consist of each of their favorite video games? Assume they have different favorites.

(a) Solve this using counting tools;

(b) Solve this the “direct way”.

2. A high school is forming a club, and they would like to have each class represented. There are 30 freshman, 55 sophomores, 45 juniors and 40 seniors, totaling 170 students. Find the probability the club, which will have 20 members, includes exactly 4 freshman, 6 sophomores, 5 juniors and 5 seniors.

3. Suppose a committee of 5 is being formed randomly from people in the College of Sciences and Humanities. There are 4 deans, 40 faculty, and 10 staff.

(a) What is the probability that none of the committee members are deans?

Solve this using counting tools;

Solve this the “direct way”.

(b) What is the probability at least one dean is on the committee?

(c) What is the probability at least one staff member is on the committee?

(d) What is the probability exactly two staff members are on the committee? Solve this both ways like part (a).

4. Suppose there are 3 sets of balls numbered 1 through 15 in a bag. If 3 balls are randomly chosen, without replacement, what is the probability that the balls have the same number on them?

5. From a deck of 52 ordinary playing cards, find the following probabilities.
 - (a) Select a hand of five cards of all spades?

 - (b) Select a hand of at least 4 cards that are spades?

6. If a pair of dice is rolled, find the probability that the sum of the two dice is less than or equal to 5.

7. Four people are doing an ESP (extrasensory perception) experiment. Each one is asked to guess a number between 1 and 10. What is the probability that no two of the four people guess the same number?

8. In a large lecture class, when students study for the final it is found that 22% of them go to office hours and tutoring, whereas 12% do neither of these. If the probability that a student goes to tutoring is 40%, find the probability that a student goes to office hours.