

Exam 3 Review Questions – Part 2

1. A bag has 10 oranges, 2 of which are rotten. A sample of 3 is chosen. What is the expected number of rotten oranges in the sample?
2. A 4-digit pin code is generated randomly. What is the probability that the last digit is a 7 or the first digit is a 6?
3. A group of 120 students go to Spain for study abroad. Eighty of the students go to Seville and the rest go to Madrid. Sixty percent of the students in Seville take a class in Spanish history and the rest take a class in Spanish Literature. In Madrid, half of the students take a class in Spanish history and half take a class in Spanish Literature. What is the probability that a student in a Spanish Literature class is in Seville?
4. Two fair six-sided dice are rolled. What are the odds in favor of rolling a sum of 7?
5. A buyer is considering a lot of 60 collectible cards and the seller will only let her check 4 cards to see if she wishes to purchase the lot. If the buyer finds any bent cards in her sample, she will not purchase the lot. What is the probability that the buyer ends up purchasing the cards given that there are 20 bent cards in the lot?
6. A tray has 33 cookies and 6 of them are broken. There are 16 chocolate chip cookies (3 are broken), 12 sugar cookies (2 are broken) and 5 oatmeal cookies. What is the probability that a broken cookie is oatmeal?
7. A class of 100 students is given a 10-point quiz with the following results:

Number of points	0	1	2	3	4	5	6	7	8	9	10
Number of students	2	8	5	10	2	10	7	30	8	10	8

Find the mean, median, mode, and standard deviation.

8. Classify each random variable as finite discrete, infinite discrete, or continuous. List the possible values of X .
 - a. X = The number of times a die is cast until a 5 is rolled.
 - b. X = How long it takes you use an ATM machine.
 - c. X = The number of cadets in a class of 100 students.

- 9.** A data distribution has a mean of 10 and a standard deviation of 1.1.
- What is the probability that a value is between 7 and 13?
 - Find a value of c such that 84% of the data is in the range $10-c$ to $10+c$
- 10.** A tree farm plants 500 trees. A tree has an 85% chance of surviving one year. Use the normal curve approximation to the binomial distribution to estimate the probability that
- more than 430 trees survive one year.
 - fewer than 410 trees survive one year.
 - between 420 and 425 trees survive one year.
- 11.** The length of a stick pretzel is normally distributed with a mean length of 6 cm and a standard deviation of 0.4 cm.
- What is the probability that a pretzel is longer than 6.3 cm?
 - What is the probability that a pretzel is between 5 and 6 cm long?
 - What lengths bracket the middle 50% of pretzels?
- 12.** A gambler decides to play a game of chance by flipping a coin. If the coin shows heads, the gambler's fortune doubles. If the coin shows tails, his fortune is cut in half. The gambler starts with \$32 and plays twice. What is the expected value of his fortune?
- 13.** Two cards are drawn in succession from a standard deck of 52 cards. What is the probability that the first card drawn is a face card given the second card drawn is a 10?
- 14.** A bag contains two one-dollar bills, a five-dollar bill and a ten-dollar bill. A player draws bills one at a time without replacement until a ten-dollar bill is drawn. Then the game stops and the money is kept by the player.
- What is the probability of winning \$16?
 - What is the probability of winning all the money in the bag?
 - What is the probability of the game ending after two draws.