Assignment 2

Holly Steeves

Table of contents

1. Find the sample space of the following scenario: When buying a new car, you've narrowed your choices to three colours: red, black, or silver. You also need to decide whether to have a sunroof or not, and whether you want leather or cloth interior.
2. Suppose that 4 out of 15 doctors in a small hospital are trained in special procedures. 11 of the 15 are under the age of 45, and 2 are both trained in special procedures and under the age of 45. What is the probability that:
    a. you are randomly assigned a doctor trained in special procedures or under the age of 45?
    b. you are randomly assigned a doctor trained in special procedures but not under the age of 45?
    c. you are randomly assigned a doctor who is neither trained in special procedures nor under the age of 45?
3. On awards day at the end of the year, Jasmine has an 85% chance of winning the top award in English, and a 4 out of 5 chance of winning an award for athletics. What is the probability that Jasmine wins both awards? What did you have to assume?
4. A box of markers contains 10 black-inked (4 wide-tipped and 6 fine-tipped) and 15 red-inked (3 wide-tipped and 12 fine-tipped). What's the probability that a randomly chosen marker will be red, given that it is fine-tipped?
5. Mrs. Harvey's algebra class has 42 students, classified by academic year and method of instruction as follows:

	In-Class Instruction	Online Instruction
Freshman	9	13
Sophomore	4	5
Junior	4	2
Senior	2	3

Mrs. Harvey randomly chooses one student's homework to grade first.

a. What is the probability that she selects an in-class student, given that she chooses from only sophomores?
b. What is the probability that she selects a junior, given that she chooses an online student?
c. If she selects a junior, what is the probability that she selects an online student?

6. Winning lottery numbers are randomly chosen from 101 balls. There are balls number 1-99, along with 2 unnumbered blank balls.

    a. What is the probability that the two blank balls are drawn first?
    b. What is the probability that the ball numbered 99 is chosen first and then a blank ball is chosen?
    c. What is the probability that a blank ball is not drawn if 5 balls are drawn in total?

7. A couple having twins is deciding on names. They narrowed their choices to 5 family names and 7 non-family names. The new father's parents only like 1 of the family names and 2 of the non-family names. Assuming that the new parents choose one family name and one non-family name, what is the probability that the names they choose will make the new grandparents happy?

8. Employees at a local factor need a unique seven-digit code to access the building. The manager wants to make each person's code from the factor's phone number, 555-9313.

    a. If there are 509 employees who need codes, will the manager have enough unique codes using only the digits in the phone number?
    b. Would there be enough 10 digit codes if he used the area code, 514 as well?

9. Lindsay is checking out books at the library, and she is primarily interested in mysteries and nonfiction. She has narrowed her selections down to seven mysteries and eight nonfiction books.

    a. How many different combinations of books can she check out if she is only allowed three books at a time.
    b. How many combinations of books can she check out if she is only allowed three books at a time and she wants at least one mystery?
    c. If she randomly chooses three books from her selections, what is the probability that they will all be mysteries?