**STUDY QUESTIONS**

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ method of assigning probabilities relies on the insight or

feelings of the person determining the probabilities.

1. If probabilities are determined "a priori" to an experiment using rules and laws, then

the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ method of assigning probabilities is being used.

3. The range of possibilities for probability values is from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Suppose a technician keeps track of all defects in raw materials for a single day and

uses this information to determine the probability of finding a defect in raw

materials the next day. She is using the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ method of assigning

probabilities.

1. The outcome of an experiment is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If these outcomes

cannot be decomposed further, then they are referred to as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. A computer hardware retailer allows you to order your own computer monitor. The

store carries five different brands of monitors. Each brand comes in 14", 15" or 17" models. In addition, you can purchase either the deluxe model or the regular model

in each brand and in each size. How many different types of monitors are available

considering all the factors? \_\_\_\_\_\_\_\_\_\_\_\_\_ You probably used the \_\_\_\_\_\_\_ rule

to solve this.

7. Suppose you are playing the Lotto game and you are trying to “pick” three numbers.

For each of the three numbers, any of the digits 0 through 9 are possible (with

replacement). How many different sets of numbers are available? \_\_\_\_\_\_\_\_\_\_\_\_\_

8. A population consists of the odd numbers between 1 and 9 inclusive. If a researcher

randomly samples numbers from the population three at a time, the sample space is

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Using combinations, how could we have determined ahead of

time how many elementary events would be in the sample space? \_\_\_\_\_\_\_\_

9. Let A = {2,3,5,6,7,9} and B = {1,3,4,6,7,9}

A B = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and A B = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

10. If the occurrence of one event does not affect the occurrence of the other event, then

the events are said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. The outcome of the roll of one die is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the outcome

of the roll of another die.

12. The event of rolling a three on a die and the event of rolling an even number on

the same roll with the same die are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

13. If the probability of the intersection of two events is zero, then the events are said to

be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

14. If three objects are selected from a bin, one at a time with replacement, the outcomes

of each selection are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. Suppose a population consists of a manufacturing facility's 1600 workers. Suppose

an experiment is conducted in which a worker is randomly selected. If an event is

the selection of a worker over 40 years old, then the event of selecting a worker 40

years or younger is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the first event.

16. The probability of selecting X given that Y has occurred is called a \_\_\_\_\_\_\_\_\_\_\_\_

probability.

17. The probability of X is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ probability.

18. The probability of X or Y occurring is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ probability.

19. The probability of X and Y occurring is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ probability.

20. Only one of the four types of probability does not use the total possible outcomes in

the denominator when calculating the probability. This type of probability is called

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ probability.

21. If the *P*(A⏐B) = *P*(A), then the events A, B are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ events.

22. If the *P*(X) = .53, the *P*(Y) = .12, and the *P*(X Y) = .07, then *P*(X Y) =

\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

23. If the *P*(X) = .26, the *P*(Y) = .31, and X, Y are mutually exclusive, then *P*(X Y) =

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

24. In a company, 47% of the employees wear glasses, 60% of the employees are

women, and 28% of the employees are women and wear glasses. Complete the

probability matrix below for this problem.

|  |  |  |
| --- | --- | --- |
|  | Wear Glasses? | |
| Yes No | |
| Gender Men  Women |  |  |
|  |  |

25. Suppose that in another company, 40% of the workers are part time and 80% of the

part time workers are men. The probability of randomly selecting a company

worker who is both part time and a man is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

26. The probability of tossing three coins in a row and getting all tails is

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is an application of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ law of

multiplication because each toss is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

27. Suppose 70% of all cars purchased in America are U.S.A. made and that 18% of all

cars purchased in America are both U.S.A. made and are red. The probability that a

randomly selected car purchased in America is red given that it is U.S.A. made is

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Use the matrix below to answer questions 28-37:

|  |  |  |  |
| --- | --- | --- | --- |
|  | C | D |  |
| A | .35 | .31 | .66 |
| B | .14 | .20 | .34 |
|  | .49 | .51 | 1.00 |

28. The probability of A and C occurring is \_\_\_\_\_\_\_\_\_\_.

29. The probability of A or D occurring is \_\_\_\_\_\_\_\_\_\_.

30. The probability of D occurring is \_\_\_\_\_\_\_\_\_\_.

31. The probability of B occurring given C is \_\_\_\_\_\_\_\_\_\_.

32. The probability of B and D occurring is \_\_\_\_\_\_\_\_\_\_.

33. The probability of C and D occurring is \_\_\_\_\_\_\_\_\_\_.

34. The probability of C or D occurring is \_\_\_\_\_\_\_\_\_\_.

35. The probability of C occurring given D is \_\_\_\_\_\_\_\_\_\_.

36. The probability of C occurring given A is \_\_\_\_\_\_\_\_\_\_.

37. The probability of C or B occurring is \_\_\_\_\_\_\_\_\_\_.

38. Suppose 42% of all people in a county have characteristic X. Suppose 17% of all

people in this county have characteristic X and characteristic Y. If a person is

randomly selected from the county who is known to have characteristic X, then the

probability that they have characteristic Y is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

39. Suppose 22% of all parts produced at a plant have flaw X and 37% have flaw Y. In

addition, suppose 53% of the parts with flaw X have flaw Y. If a part is randomly

selected, the probability that it has flaw X or flaw Y is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

40. Another name for revision of probabilities is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

41. Suppose the prior probabilities of A and B are .57 and .43 respectively. Suppose

that *P*(E⏐A) = .24 and *P*(E⏐B) = .56. If E is known to have occurred, then the

revised probability of A occurring is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and of B occurring is

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**ANSWERS TO STUDY QUESTIONS**

1. Subjective 23. .57

2. Classical 24. Wear Glasses

Yes No

3. 0, 1 Men .19 .21 .40

Women .28 .32 .60

4. Relative Frequency .47 .53 1.00

5. Event, Elementary Events 25. .32

6. 30, *mn* counting rule 26. 1/8 = .125, Special, Independent

7. 103 = 1000 numbers 27. .2571

8. {(1,3,5), (1,3,7), (1,3,9), (1,5,7), 28. .35

(1,5,9), (1,7,9), (3,5,7), (3,5,9),

(3,7,9), (5,7,9)}, 5C3 = 10 29. .86

9. {1,2,3,4,5,6,7,9}, {3,6,7,9} 30. .51

10. Independent 31. .2857

11. Independent 32. .20

12. Mutually Exclusive 33. .0000

13. Mutually Exclusive 34. 1.00

14. Independent 35. .0000

15. Complement 36. .5303

16. Conditional 37. .69

17. Marginal 38. .4048

18. Union 39. .4734

19. Joint or Intersection 40. Bayes’ Rule

20. Conditional 41. .3623, .6377

21. Independent

22. .58