

Business Statistics, 9e (Groebner/Shannon/Fry)

Chapter 4 Introduction to Probability

1) A car salesman has noted that the probability that the dealership sells a car on a Saturday morning is .30. Then the probability of the dealership not selling a car on Saturday morning is .70.

Answer: TRUE

Diff: 1

Keywords: probability, dependent, mutually exclusive

Section: 4-1 The Basics of Probability

Outcome: 1

2) A car salesman states that the probability that the dealership sells a car on a Saturday morning is .30. The method of probability assessment that he has used is most likely classical assessment.

Answer: FALSE

Diff: 1

Keywords: probability, assessment, relative frequency of occurrence

Section: 4-1 The Basics of Probability

Outcome: 1

3) If the probability of one event occurring is .40 and the probability of a second event occurring is 0.60, then the probability that both events will occur must be 1.0 since that is the maximum value a probability can be.

Answer: FALSE

Diff: 1

Keywords: probability, event

Section: 4-1 The Basics of Probability

Outcome: 1

4) If a company has the opportunity to bid on three contracts, A, B, and C, then the number of these contracts that are awarded to the company would be considered an elementary event.

Answer: TRUE

Diff: 2

Keywords: probability, elementary event

Section: 4-1 The Basics of Probability

Outcome: 1

5) If two events are mutually exclusive, it is possible for them to also be independent of each other.

Answer: FALSE

Diff: 2

Keywords: experiment, outcome, probability

Section: 4-1 The Basics of Probability

Outcome: 1

6) Suppose a single die (a 6-sided cube with sides numbered 1 through 6) is rolled once. The event of interest is defined as rolling an even number. This can be said to be an elementary event.

Answer: FALSE

Diff: 1

Keywords: sample space, elementary event

Section: 4-1 The Basics of Probability

Outcome: 1

7) In most situations, there is no difference between the events and the elementary events.

Answer: FALSE

Diff: 1

Keywords: event, elementary event, experiment

Section: 4-1 The Basics of Probability

Outcome: 1

8) A manufacturing company makes three types of products. Each time it makes a product, the item can be either good or defective and it can be either customized or standard. The events consisting of customized and defective would be considered mutually exclusive since they apply to different attributes of the product.

Answer: FALSE

Diff: 2

Keywords: event, mutually exclusive

Section: 4-1 The Basics of Probability

Outcome: 1

9) Two football teams play in the Super Bowl. The event of team A winning and the event of team B winning can be said to be mutually exclusive.

Answer: TRUE

Diff: 1

Keywords: event, mutually exclusive

Section: 4-1 The Basics of Probability

Outcome: 1

10) A product that is produced at Ramsey Manufacturing goes through three steps to be built. At step one, the components are assembled by technicians. At step two, the product is sanded, and at step three the product is painted. The product can become defective if any of these three steps is performed incorrectly. The three steps are done by different people in different locations. We let D_1 = defect introduced at step 1, D_2 = defect introduced at step 2, and D_3 = defect introduced at step three. Based on this situation these three events would be considered to be mutually exclusive.

Answer: FALSE

Diff: 2

Keywords: mutually exclusive, independent event

Section: 4-1 The Basics of Probability

Outcome: 1

11) Suppose a player is dealt 2 cards from a standard deck of 52 playing cards. To determine the probability of having a blackjack would involve classical probability.

Answer: TRUE

Diff: 2

Keywords: classical probability

Section: 4-1 The Basics of Probability

Outcome: 1

12) In playing the game Monopoly, the probability of a player landing on Park Place would be assessed using classical probability assessment.

Answer: TRUE

Diff: 2

Keywords: classical, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

13) If a manager were interested in assessing the probability that a new product will be successful in a New Jersey market area, she would most likely use relative frequency of occurrence as the method for assessing the probability.

Answer: FALSE

Diff: 2

Keywords: probability, subjective

Section: 4-1 The Basics of Probability

Outcome: 1

14) Classical probability assessment is likely to be the most common method of probability assessment used in business decision making.

Answer: FALSE

Diff: 1

Keywords: subjective, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

15) The owners of Greg's Department Store have reason to believe that one of their employees has been stealing from the store. In an interview with the police, the owner says that she is 75 percent sure that the employee is stealing. This probability is an example of one that was assessed using classical probability.

Answer: FALSE

Diff: 2

Keywords: subjective, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

16) When a patient arrives at a clinic complaining of several specific symptoms, the doctor who makes the diagnosis says that he is 80 percent certain that the patient has a particular problem. It is likely that he is basing this assessment on relative frequency of occurrence.

Answer: TRUE

Diff: 2

Keywords: probability, relative, frequency, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

17) If you were planning to take a small group out to dinner on a Thursday evening and you were considering whether to call ahead for a reservation, the method of probability assessment you would most likely use to assess the chances of being able to get in for dinner without having a reservation would be subjective assessment.

Answer: TRUE

Diff: 2

Keywords: probability, subjective, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

18) One of the difficulties in using the relative frequency of occurrence method for assessing probabilities in business situations is getting a large enough set of examples that match the one in question.

Answer: TRUE

Diff: 1

Keywords: relative, frequency, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

19) Suppose a coin is flipped twice. The event of getting heads on the first toss and the event of getting heads on the second toss could be said to be mutually exclusive.

Answer: FALSE

Diff: 1

Keywords: event, mutually exclusive, independent

Section: 4-1 The Basics of Probability

Outcome: 1

20) At a potato processing plant in the state of Washington, 400 potatoes have been examined for disease. Of these, four were diseased. Based on this, the plant manager has stated that the probability of finding a diseased potato is 0.01. He is applying subjective probability to arrive at this 0.01 value.

Answer: FALSE

Diff: 2

Keywords: relative, frequency, probability

Section: 4-1 The Basics of Probability

Outcome: 1

21) A New Jersey company relies on a steady supply of power to keep its manufacturing going. Recently at a planning meeting, the general manager stated that the chance of a rolling blackout affecting production is 0.15. She most likely made this assessment using subjective probability assessment.

Answer: TRUE

Diff: 2

Keywords: subjective, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

22) It is correct to say that subjective probability assessments are neither right nor wrong, but are merely reflections of the state of mind of the individual making the probability assessment.

Answer: TRUE

Diff: 2

Keywords: subjective, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

23) A dam on a river that holds back a water reservoir begins to leak. Engineers say that there is a 10 percent chance of the dam breaking if repairs are not made. This is an example of classical probability.

Answer: FALSE

Diff: 2

Keywords: subjective, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

24) During the past week, of the 250 customers at the Dairy Queen who ordered a Blizzard, 50 ordered strawberry. This means that of the next five Blizzard customers, exactly one will order strawberry.

Answer: FALSE

Diff: 2

Keywords: relative, frequency, probability, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

25) When a construction company bids on a contract, the events will be win or lose. The closer the probability is to 0.50, the greater the uncertainty about whether the company will win or lose the bid.

Answer: TRUE

Diff: 1

Keywords: event, mutually exclusive

Section: 4-1 The Basics of Probability

Outcome: 1

26) Sometime it is necessary to assign probabilities based on a person's belief that an outcome will occur.

Answer: TRUE

Diff: 1

Keywords: Subjective Probability Assessment

Section: 4-1 The Basics of Probability

Outcome: 1

27) Mutually exclusive means that the occurrence of event A has no effect on the probability of the occurrence of event B, and independent means the occurrence of event A prevents the occurrence of event B.

Answer: FALSE

Diff: 3

Keywords: independent, mutually exclusive

Section: 4-1 The Basics of Probability

Outcome: 1

28) A used car lot has 15 cars. Five of these cars were manufactured in the United States and the others were made in other countries. If one car is purchased at random from this car lot, the probability that it is a U.S. car is 0.33.

Answer: TRUE

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 2

29) If a single die is rolled (a cube where the sides are numbered 1 through 6), the probability of rolling at least a 3 is 0.33.

Answer: FALSE

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 2

30) Suppose 10 students are enrolled in a class and the probability of at least 8 showing up on a given day is 90 percent. Then the probability of 7 or fewer showing that day is 10 percent.

Answer: TRUE

Diff: 1

Keywords: probability, complement

Section: 4-2 True Rules of Probability

Outcome: 2

31) The following probability distribution was subjectively assessed for the number of sales a salesperson would make if he or she made five sales calls in one day.

Sales	Probability
0	0.10
1	0.15
2	0.20
3	0.30
4	0.20
5	0.05

Given this distribution, the probability that the number of sales is less than 2 is 0.15.

Answer: FALSE

Diff: 1

Keywords: probability, addition

Section: 4-2 True Rules of Probability

Outcome: 2

32) The following probability distribution was subjectively assessed for the number of sales a salesperson would make if he or she made five sales calls in one day.

Sales	Probability
0	0.10
1	0.15
2	0.20
3	0.30
4	0.20
5	0.05

Given this distribution, the probability that the number of sales is 2 or 3 is 0.50.

Answer: TRUE

Diff: 1

Keywords: probability, addition

Section: 4-2 True Rules of Probability

Outcome: 2

33) The following probability distribution was subjectively assessed for the number of sales a salesperson would make if he or she made five sales calls in one day.

Sales	Probability
0	0.10
1	0.15
2	0.20
3	0.30
4	0.20
5	0.05

Given this distribution, the probability that the number of sales is more than 2 is 0.80.

Answer: FALSE

Diff: 1

Keywords: probability, addition

Section: 4-2 True Rules of Probability

Outcome: 2

34) When the salesperson makes a sale, there are three possible sales levels: large, medium, and small. The probability of a large sale is 0.20 and the chance of a medium sale is 0.60. Thus, when a sale is made, the chance of it being a small sale is 0.20.

Answer: TRUE

Diff: 2

Keywords: probability, addition

Section: 4-2 True Rules of Probability

Outcome: 2

35) Assume $P(A) = 0.4$ and $P(B) = 0.2$ and $P(A \text{ and } B) = 0.1$, then the probability of $P(A \text{ or } B) = 0.7$.

Answer: FALSE

Diff: 1

Keywords: probability, addition rule

Section: 4-2 True Rules of Probability

Outcome: 2

36) When the salesperson makes a sale, there are three possible sales levels: large, medium, and small. The probability of a large sale is 0.20 and the chance of a medium sale is 0.60. If a salesperson makes two sales, the probability that at least one is large is 0.36.

Answer: TRUE

Diff: 3

Keywords: probability, conditional

Section: 4-2 True Rules of Probability

Outcome: 2

37) The following probability distribution was subjectively assessed for the number of sales a salesperson would make if he or she made five sales calls in one day.

Sales	Probability
0	0.10
1	0.15
2	0.20
3	0.30
4	0.20
5	0.05

When the salesperson makes a sale, there are three possible sales levels: large, medium, and small. The probability of a large sale is 0.20 and the chance of a medium sale is 0.60. The probability on a given day that the salesperson will make one sale and that it is medium is 0.09.

Answer: TRUE

Diff: 2

Keywords: probability, joint, marginal

Section: 4-2 True Rules of Probability

Outcome: 2

38) When customers come to a bank, there are three primary locations they may select to go to: teller, loan officer, or escrow department. Based on past experience, the following probability distribution applies:

Location	Probability
Teller	0.60
Loan Officer	0.30
Escrow	0.10

Seventy percent of customers are males. Thus, the probability that the next customer to enter the bank is a male who goes to the teller is 1.30.

Answer: FALSE

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 2

39) When customers come to a bank, there are three primary locations they may select to go to: teller, loan officer, or escrow department. Based on past experience, the following probability distribution applies:

Location	Probability
Teller	0.60
Loan Officer	0.30
Escrow	0.10

Seventy percent of customers are males. The probability that the next two customers to enter the bank are males and go to the Loan Officer is 0.42.

Answer: FALSE

Diff: 2

Keywords: probability, multiplication

Section: 4-2 True Rules of Probability

Outcome: 3

40) When customers come to a bank, there are three primary locations they may select to go to: teller, loan officer, or escrow department. Based on past experience, the following probability distribution applies:

Location	Probability
Teller	0.60
Loan Officer	0.30
Escrow	0.10

Seventy percent of customers are males. The probability that three consecutive customers all go to a teller is approximately 0.22.

Answer: TRUE

Diff: 2

Keywords: probability, multiplication

Section: 4-2 True Rules of Probability

Outcome: 3

41) When customers come to a bank, there are three primary locations they may select to go to: teller, loan officer, or escrow department. Based on past experience, the following probability distribution applies:

Location	Probability
Teller	0.60
Loan Officer	0.30
Escrow	0.10

Seventy percent of customers are males. The probability that the next customer will be male and will go to either the teller or the escrow department is 0.49.

Answer: TRUE

Diff: 3

Keywords: probability, multiplication

Section: 4-2 True Rules of Probability

Outcome: 3

42) There are three general locations that a taxi can go to: the airport, downtown, and elsewhere. When a taxi driver starts in the downtown location, there is a 0.40 chance that his first call will take him to the airport and a 0.40 chance of going to another downtown location. Once a taxi is at the airport, there is a 0.80 probability that the next fare will take him downtown and a 0.20 chance of going elsewhere. The probability of a call from anywhere except downtown taking him to the airport is 0.20. Therefore, the probability that the taxi is at the airport when the third call arrives after going on shift is 0.20.

Answer: TRUE

Diff: 3

Keywords: probability, joint

Section: 4-2 True Rules of Probability

Outcome: 2

43) Assume $P(A) = 0.6$, $P(B) = 0.7$, and $P(A \text{ and } B) = 0.42$, which means that events A and B are independent of each other.

Answer: TRUE

Diff: 2

Keywords: probability, independence

Section: 4-2 True Rules of Probability

Outcome: 2

44) The Crystal Window Company makes windows at three locations: Reno, Las Vegas, and Boise. Some windows made by the company contain a visible defect and must be replaced. Each defect costs the company \$45.00. The Reno plant makes 40 percent of all windows while the Las Vegas and Boise plants split the remaining production evenly. A recent quality study shows that 8 percent of the Reno windows contain a defect, 11 percent of the Las Vegas windows contain a defect, while 4 percent of the windows made in Boise have a defect. Once the windows are made, they are shipped to a central warehouse where they are commingled and the location where they were made is lost.

Based on this information, if a defective window is discovered, it was most likely made by the Las Vegas plant.

Answer: TRUE

Diff: 3

Keywords: probability, marginal

Section: 4-2 True Rules of Probability

Outcome: 2

45) The Crystal Window Company makes windows at three locations: Reno, Las Vegas, and Boise. Some windows made by the company contain a visible defect and must be replaced. Each defect costs the company \$45.00. The Reno plant makes 40 percent of all windows while the Las Vegas and Boise plants split the remaining production evenly. A recent quality study shows that 8 percent of the Reno windows contain a defect, 11 percent of the Las Vegas windows contain a defect, while 4 percent of the windows made in Boise have a defect. Once the windows are made, they are shipped to a central warehouse where they are commingled and the location where they were made is lost.

Based on this information the probability that a defective window was made by the Boise plant is approximately 0.16.

Answer: TRUE

Diff: 3

Keywords: probability, marginal

Section: 4-2 True Rules of Probability

Outcome: 2

46) The Crystal Window Company makes windows at three locations: Reno, Las Vegas, and Boise. Some windows made by the company contain a visible defect and must be replaced. Each defect costs the company \$45.00. The Reno plant makes 40 percent of all windows while the Las Vegas and Boise plants split the remaining production evenly. A recent quality study shows that 8 percent of the Reno windows contain a defect, 11 percent of the Las Vegas windows contain a defect, while 4 percent of the windows made in Boise have a defect. Once the windows are made, they are shipped to a central warehouse where they are commingled and the location where they were made is lost.

Based on this information, the percentage of the defective cost that should be allocated to the Reno plant is approximately 42 percent.

Answer: TRUE

Diff: 3

Keywords: probability, marginal

Section: 4-2 True Rules of Probability

Outcome: 2

47) The Baker Oil and Gas Company has four retail locations, code-named A, B, C, and D. The following table illustrates the percentage of total company sales at each store and also the percentage of customers at that store who make purchases with debit cards:

Store	Proportion of Total Sales	Proportion of Customers Using Debit
A	0.18	0.32
B	0.30	0.19
C	0.41	0.18
D	0.11	0.40

Based on this information, the probability that a customer will use a debit card is just slightly greater than 0.23.

Answer: TRUE

Diff: 3

Keywords: probability, joint

Section: 4-2 True Rules of Probability

Outcome: 2

48) The Baker Oil and Gas Company has four retail locations, code-named A, B, C, and D. The following table illustrates the percentage of total company sales at each store and also the percentage of customers at that store who make purchases with debit cards:

Store	Proportion of Total Sales	Proportion of Customers Using Debit
A	0.18	0.32
B	0.30	0.19
C	0.41	0.18
D	0.11	0.40

Based on this information, given that a customer has used a debit card to make the purchase, the sale was most likely made at store D.

Answer: FALSE

Diff: 3

Keywords: probability, joint

Section: 4-2 True Rules of Probability

Outcome: 2

49) The Baker Oil and Gas Company has four retail locations, code-named A, B, C, and D. The following table illustrates the percentage of total company sales at each store and also the percentage of customers at that store who make purchases with debit cards:

Store	Proportion of Total Sales	Proportion of Customers Using Debit
A	0.18	0.32
B	0.30	0.19
C	0.41	0.18
D	0.11	0.40

Based on this information, the probability that a customer who used a debit card shopped at store C is 0.0738.

Answer: FALSE

Diff: 3

Keywords: probability, joint

Section: 4-2 True Rules of Probability

Outcome: 2

50) If a six-sided die is tossed two times and "4" shows up both times, the probability of "4" on the third trial is much larger than any other outcome.

Answer: FALSE

Diff: 2

Keywords: probability, independence

Section: 4-2 True Rules of Probability

Outcome: 2

51) An event is:

- A) the list of possible outcomes that can occur from a selection or decision.
- B) a collection of elementary events.
- C) similar to an experiment but not controlled by the decision maker.
- D) more frequently found in business than in other disciplines.

Answer: B

Diff: 1

Keywords: event

Section: 4-1 The Basics of Probability

Outcome: 1

52) The method of probability assessment that relies on an examination of historical data from similar situations is:

- A) relative frequency of occurrence.
- B) classical assessment.
- C) historical assessment.
- D) subjective assessment.

Answer: A

Diff: 2

Keywords: relative frequency, probability assessment

Section: 4-1 The Basics of Probability

Outcome: 1

53) The method of probability assessment that is least likely to be used by business decision makers is:

- A) subjective assessment.
- B) relative frequency of occurrence.
- C) classical assessment.
- D) None of the above is used by decision makers.

Answer: C

Diff: 2

Keywords: classical assessment, probability

Section: 4-1 The Basics of Probability

Outcome: 1

54) At gambling casinos all over the country, a popular dice game is called craps. The probability of a player winning at this game can be assessed using:

- A) subjective assessment.
- B) classical probability.
- C) relative frequency of occurrence.
- D) None of the above

Answer: B

Diff: 2

Keywords: classical probability assessment

Section: 4-1 The Basics of Probability

Outcome: 1

55) A consumer products company is planning to introduce a new product. The method that is least likely to be used to assess the probability of the product being successful is:

- A) classical probability assessment.
- B) subjective assessment.
- C) relative frequency of occurrence.
- D) elementary events.

Answer: A

Diff: 2

Keywords: classical, relative, assessment

Section: 4-1 The Basics of Probability

Outcome: 1

56) A study was recently done in which 500 people were asked to indicate their preferences for one of three products. The following table shows the breakdown of the responses by gender of the respondents.

Gender	Product Preference		
	A	B	C
Male	80	20	10
Female	200	70	120

If the people conducting the study wish to assess the probability that product A will be preferred by members of the target population, the method of assessment to be used would most likely be:

- A) classical probability assessment.
- B) subjective assessment.
- C) relative frequency of occurrence.
- D) independent events.

Answer: C

Diff: 2

Keywords: relative frequency, probability assessment

Section: 4-1 The Basics of Probability

Outcome: 1

57) A study was recently done in which 500 people were asked to indicate their preferences for one of three products. The following table shows the breakdown of the responses by gender of the respondents.

Gender	Product Preference		
	A	B	C
Male	80	20	10
Female	200	70	120

Based on these data, the probability that a person in the population will prefer product A can be assessed as:

- A) 0.18
- B) 0.56
- C) 0.286
- D) 0.16

Answer: B

Diff: 2

Keywords: probability, relative frequency

Section: 4-1 The Basics of Probability

Outcome: 1

58) A study was recently done in which 500 people were asked to indicate their preferences for one of three products. The following table shows the breakdown of the responses by gender of the respondents.

Gender	Product Preference		
	A	B	C
Male	80	20	10
Female	200	70	120

Suppose one person is randomly chosen. Based on this data, what is the probability that the person chosen is a female who prefers product C?

- A) 0.24
- B) 0.86
- C) 0.92
- D) 0.31

Answer: A

Diff: 2

Keywords: probability, relative frequency

Section: 4-1 The Basics of Probability

Outcome: 1

59) When a customer enters a store there are three outcomes that can occur: buy nothing, buy a small amount, or buy a large amount. In this situation, if a customer buys a large amount, he or she cannot also buy a small amount or buy nothing. Thus the events are:

- A) independent.
- B) mutually exclusive.
- C) all inclusive.
- D) dependent events.

Answer: B

Diff: 1

Keywords: mutually exclusive, event

Section: 4-1 The Basics of Probability

Outcome: 1

60) When a pair of dice are rolled, the outcome for each die can be said to be:

- A) mutually exclusive.
- B) mutually inclusive.
- C) dependent.
- D) independent.

Answer: A

Diff: 1

Keywords: dependent, event

Section: 4-1 The Basics of Probability

Outcome: 1

61) If two events are independent, then

- A) they must be mutually exclusive.
- B) the sum of their probabilities must be equal to one.
- C) their intersection must be zero.
- D) None of the above

Answer: D

Diff: 3

Keywords: mutually exclusive, independent event

Section: 4-1 The Basics of Probability

Outcome: 1

62) The managers of a local golf course have recently conducted a study of the types of golf balls used by golfers based on handicap. A joint frequency table for the 100 golfers covered in the survey is shown below:

Handicap	Type of Golf Ball			
	Strata	Titleist	Nike	Other
< 2	5	8	3	2
2 to < 10	8	7	9	10
≥ 10	7	8	10	23

Based on these data, the probability of a golfer having a handicap less than 10 is:

- A) 0.52
- B) 0.10
- C) 0.34
- D) None of the above

Answer: A

Diff: 2

Keywords: probability, events

Section: 4-2 True Rules of Probability

Outcome: 2

63) The managers of a local golf course have recently conducted a study of the types of golf balls used by golfers based on handicap. A joint frequency table for the 100 golfers covered in the survey is shown below:

Handicap	Type of Golf Ball			
	Strata	Titleist	Nike	Other
< 2	5	8	3	2
2 to < 10	8	7	9	10
≥ 10	7	8	10	23

Based on these data, the probability that a player will use a Strata golf ball is:

- A) 0.15
- B) 0.20
- C) 0.18
- D) None of the above

Answer: B

Diff: 2

Keywords: probability, events

Section: 4-2 True Rules of Probability

Outcome: 2

64) The managers of a local golf course have recently conducted a study of the types of golf balls used by golfers based on handicap. A joint frequency table for the 100 golfers covered in the survey is shown below:

Handicap	Type of Golf Ball			
	Strata	Titleist	Nike	Other
< 2	5	8	3	2
2 to < 10	8	7	9	10
≥ 10	7	8	10	23

If a player comes to the course using a Nike golf ball, the probability that he or she has a handicap of at least 10 is:

- A) 0.22
- B) 0.48
- C) slightly greater than 0.45
- D) 0.10

Answer: C

Diff: 2

Keywords: probability, conditional

Section: 4-2 True Rules of Probability

Outcome: 2

65) The managers of a local golf course have recently conducted a study of the types of golf balls used by golfers based on handicap. A joint frequency table for the 100 golfers covered in the survey is shown below:

Handicap	Type of Golf Ball			
	Strata	Titleist	Nike	Other
< 2	5	8	3	2
2 to < 10	8	7	9	10
≥ 10	7	8	10	23

Based on these data, the probability of someone using a Strata ball and having a handicap under 2 is:

- A) 0.05
- B) 0.38
- C) 0.25
- D) None of the above

Answer: C

Diff: 2

Keywords: probability, events

Section: 4-2 True Rules of Probability

Outcome: 2

66) The managers of a local golf course have recently conducted a study of the types of golf balls used by golfers based on handicap. A joint frequency table for the 100 golfers covered in the survey is shown below:

Handicap	Type of Golf Ball			
	Strata	Titleist	Nike	Other
< 2	5	8	3	2
2 to < 10	8	7	9	10
≥ 10	7	8	10	23

Based on these data, if a player has a handicap that is 10 or more, the probability that he or she will use a Nike golf ball is:

- A) 0.21
- B) 0.10
- C) 0.45
- D) 0.48

Answer: A

Diff: 2

Keywords: probability, conditional

Section: 4-2 True Rules of Probability

Outcome: 2

67) The Anderson Lumber Company has three sawmills that produce boards of different lengths. The following table is a joint frequency distribution based on a random sample of 1,000 boards selected from the lumber inventory.

Sawmill	Board Length			
	8 ft	10 ft	12 ft	14 ft
A	140	100	80	14
B	250	20	100	50
C	160	50	16	20

Based on these data, the probability of selecting a board from inventory that is 10 feet long is:

- A) 0.196
- B) 0.450
- C) 0.084
- D) 0.170

Answer: D

Diff: 1

Keywords: probability, joint frequency

Section: 4-2 True Rules of Probability

Outcome: 2

68) The Anderson Lumber Company has three sawmills that produce boards of different lengths. The following table is a joint frequency distribution based on a random sample of 1,000 boards selected from the lumber inventory.

Sawmill	Board Length			
	8 ft	10 ft	12 ft	14 ft
A	140	100	80	14
B	250	20	100	50
C	160	50	16	20

Based on these data, if a board is selected that is 12 feet long, the probability that it was made at sawmill A is:

- A) 0.08
- B) 0.41
- C) 0.24
- D) 0.20

Answer: B

Diff: 2

Keywords: probability, joint frequency

Section: 4-2 True Rules of Probability

Outcome: 2

69) The Anderson Lumber Company has three sawmills that produce boards of different lengths. The following table is a joint frequency distribution based on a random sample of 1000 boards selected from the lumber inventory.

Sawmill	Board Length			
	8 ft	10 ft	12 ft	14 ft
A	140	100	80	14
B	250	20	100	50
C	160	50	16	20

Based on these data, if three boards are selected at random, the probability that all three were made at sawmill A is:

- A) 0.037
- B) 0.334
- C) 1.00
- D) 0.556

Answer: A

Diff: 2

Keywords: probability, joint frequency

Section: 4-2 True Rules of Probability

Outcome: 2

70) Harrison Water Sports has three retail outlets: Seattle, Portland, and Phoenix. The Seattle store does 50 percent of the total sales in a year, while the Portland store does 35 percent of the total sales. Further analysis indicates that of the sales in Seattle, 20 percent are in boat accessories. The percentage of boat accessories at the Portland store is 30 and the percentage at the Phoenix store is 25. If a sales dollar is recorded as a boat accessory, the probability that the sale was made at the Portland store is:

- A) slightly greater than 0.43
- B) 0.35
- C) 0.2425
- D) None of the above

Answer: A

Diff: 3

Keywords: probability, conditional

Section: 4-2 True Rules of Probability

Outcome: 2

71) Harrison Water Sports has three retail outlets: Seattle, Portland, and Phoenix. The Seattle store does 50 percent of the total sales in a year, while the Portland store does 35 percent of the total sales. Further analysis indicates that of the sales in Seattle, 20 percent are in boat accessories. The percentage of boat accessories at the Portland store is 30 and the percentage at the Phoenix store is 25. Overall, the probability that a sale by Harrison Water Sports will be for a boat accessory is:

- A) 0.105
- B) 0.2425
- C) 0.75
- D) None of the above

Answer: B

Diff: 3

Keywords: probability, joint frequency

Section: 4-2 True Rules of Probability

Outcome: 2

72) Of the last 100 customers entering a computer shop, 25 have purchased a computer. If the classical probability assessment for computing probability is used, the probability that the next customer will purchase a computer is:

- A) 0.25
- B) 0.50
- C) 1.00
- D) 0.75

Answer: B

Diff: 3

Keywords: probability, classical probability assessment

Section: 4-2 True Rules of Probability

Outcome: 2

73) A special roulette wheel, which has an equal number of red and black spots, has come up red four times in a row. Assuming that the roulette wheel is fair, what concept allows a player to know that the probability the next spin of the wheel will come up black is 0.5?

- A) Concept of independent events
- B) Concept of mutually exclusive events
- C) Concept of dependent events
- D) Concept of mutually inclusive events

Answer: A

Diff: 1

Keywords: probability

Section: 4-1 The Basics of Probability

Outcome: 1

74) In a survey, respondents were asked to indicate their favorite brand of cereal (Post or Kellogg's). They were allowed only one choice. What is the probability concept that implies it is not possible for a single respondent to state both Post and Kellogg's to be the favorite cereal?

- A) Concept of independent events
- B) Concept of mutually exclusive events
- C) Concept of dependent events
- D) Concept of mutually inclusive events

Answer: B

Diff: 1

Keywords: probability

Section: 4-1 The Basics of Probability

Outcome: 1

75) What method of probability assessment would most likely be used to assess the probability that a major earthquake will occur in California in the next three years?

- A) Classical probability based on the ratio of the number of ways the event can occur
- B) Relative frequency based on previous history
- C) Subjective probability based on expert opinion
- D) Independent probability based on two unrelated outcomes

Answer: C

Diff: 1

Keywords: probability

Section: 4-1 The Basics of Probability

Outcome: 1

76) What method of probability assessment would most likely be used to assess the probability that a customer will return a purchase for a refund?

- A) Classical probability based on the ratio of the number of ways the event can occur
- B) Relative frequency based on previous history
- C) Subjective probability based on expert opinion
- D) Independent probability based on two unrelated outcomes

Answer: B

Diff: 1

Keywords: probability

Section: 4-1 The Basics of Probability

Outcome: 1

77) An inventory of appliances contains four white washers and one black washer. If a customer selects one at random, what is the probability that the black washer will be selected?

- A) 0.5
- B) 0.4
- C) 0.2
- D) 0.8

Answer: C

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

78) Long-time friends, Pat and Tom, agree on many things, but not the outcome of the American League pennant race and the World Series. Pat is originally from Boston, and Tom is from New York. They have a steak dinner bet on next year's race, with Pat betting on the Red Sox and Tom on the Yankees. Both are convinced they will win. What probability assessment technique is being used by the two friends?

- A) Subjective probability
- B) Classical probability
- C) Relative frequency probability
- D) Independent probability

Answer: A

Diff: 1

Keywords: probability

Section: 4-1 The Basics of Probability

Outcome: 1

79) Students who live on campus and purchase a meal plan are randomly assigned to one of three dining halls: the Commons, Northeast, and Frazier. What is the probability that the next student to purchase a meal plan will be assigned to the Commons?

- A) 0.66
- B) 0.5
- C) 0.25
- D) 0.33

Answer: D

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

80) The results of a census of 2,500 employees of a mid-sized company with 401(k) retirement accounts are as follows:

Account Balance (to nearest \$)	Male	Female
\$25,000	635	495
\$25,000-\$49,999	185	210
\$50,000-\$99,999	515	260
\$100,000	155	45

Suppose researchers are going to sample employees from the company for further study.

Based on the relative frequency assessment method, what is the probability that a randomly selected employee will be a female?

- A) 0.1580
- B) 0.1040
- C) 0.6160
- D) 0.4040

Answer: D

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

81) The results of a census of 2,500 employees of a mid-sized company with 401(k) retirement accounts are as follows:

Account Balance (to nearest \$)	Male	Female
\$25,000	635	495
\$25,000-\$49,999	185	210
\$50,000-\$99,999	515	260
\$100,000	155	45

Suppose researchers are going to sample employees from the company for further study.

Based on the relative frequency assessment method, what is the probability that a randomly selected employee will have a 401(k) account balance of between \$25,000 and \$49,999?

- A) 0.1580
- B) 0.1040
- C) 0.6160
- D) 0.4040

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

82) The results of a census of 2,500 employees of a mid-sized company with 401(k) retirement accounts are as follows:

Account Balance (to nearest \$)	Male	Female
\$25,000	635	495
\$25,000-\$49,999	185	210
\$50,000-\$99,999	515	260
\$100,000	155	45

Suppose researchers are going to sample employees from the company for further study.

Compute the probability that a randomly selected employee will be a female with an account balance between \$50,000 and \$99,999.

- A) 0.1580
- B) 0.1040
- C) 0.6160
- D) 0.4040

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

83) Cross County Bicycles makes two mountain bike models that each come in three colors. The following table shows the production volumes for last week:

Model	Color		
	Blue	Brown	White
XB-50	302	105	200
YZ-99	40	205	130

Based on the relative frequency assessment method, what is the probability that a manufactured item is brown?

- A) 0.2088
- B) 0.3819
- C) 0.3157
- D) 0.1324

Answer: C

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

84) Cross County Bicycles makes two mountain bike models that each come in three colors. The following table shows the production volumes for last week:

Model	Color		
	Blue	Brown	White
XB-50	302	105	200
YZ-99	40	205	130

What is the probability that the product manufactured is a YZ-99?

- A) 0.2088
- B) 0.3819
- C) 0.3157
- D) 0.1324

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

85) Cross County Bicycles makes two mountain bike models that each come in three colors. The following table shows the production volumes for last week:

Model	Color		
	Blue	Brown	White
XB-50	302	105	200
YZ-99	40	205	130

What is the joint probability that a product manufactured is a YZ-99 and brown?

- A) 0.2088
- B) 0.3819
- C) 0.3157
- D) 0.1324

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

86) Based on weather data collected in Racine, Wisconsin, on Christmas Day, the weather had the following distribution:

Event	Relative Frequency
Clear & dry	0.20
Cloudy & dry	0.30
Rain	0.40
Snow	0.10

/Thompson_sn3t_WordExports/Thompson_sn3t_WordExports

Based on these data, what is the probability that next Christmas will be dry?

- A) 0.45
- B) 0.50
- C) 0.60
- D) 0.70

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

87) Based on weather data collected in Racine, Wisconsin, on Christmas Day, the weather had the following distribution:

Event	Relative Frequency
Clear & dry	0.20
Cloudy & dry	0.30
Rain	0.40
Snow	0.10

Based on the data, what is the probability that next Christmas will be rainy or cloudy and dry?

- A) 0.45
- B) 0.50
- C) 0.60
- D) 0.70

Answer: D

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

88) Based on weather data collected in Racine, Wisconsin, on Christmas Day, the weather had the following distribution:

Event	Relative Frequency
Clear & dry	0.20
Cloudy & dry	0.30
Rain	0.40
Snow	0.10

Supposing next Christmas is dry, determine the probability that it will also be cloudy.

- A) 0.45
- B) 0.50
- C) 0.60
- D) 0.70

Answer: C

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

89) The Jack In The Box franchise in Bangor, Maine, has determined that the chance a customer will order a soft drink is 0.90. The probability that a customer will order a hamburger is 0.60. The probability that a customer will order french fries is 0.50.

If a customer places an order, what is the probability that the order will include a soft drink and no fries if these two events are independent?

- A) 0.45
- B) 0.50
- C) 0.65
- D) 0.70

Answer: A

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

90) The Jack In The Box franchise in Bangor, Maine, has determined that the chance a customer will order a soft drink is 0.90. The probability that a customer will order a hamburger is 0.60. The probability that a customer will order french fries is 0.50.

The restaurant has also determined that if a customer orders a hamburger, the probability the customer will also order fries is 0.80. Determine the probability that the order will include a hamburger and fries.

- A) 0.45
- B) 0.58
- C) 0.68
- D) 0.48

Answer: D

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

91) Ponderosa Paint and Glass carries three brands of paint. A customer wants to buy another gallon of paint to match paint she purchased at the store previously. She can't recall the brand name and does not wish to return home to find the old can of paint. So she selects two of the three brands of paint at random and buys them.

What is the probability that she matched the paint brand?

- A) $\frac{3}{2}$
- B) $\frac{2}{3}$
- C) $\frac{1}{9}$
- D) $\frac{3}{4}$

Answer: B

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

92) Ponderosa Paint and Glass carries three brands of paint. A customer wants to buy another gallon of paint to match paint she purchased at the store previously. She can't recall the brand name and does not wish to return home to find the old can of paint. So she selects two of the three brands of paint at random and buys them.

Her husband also goes to the paint store and fails to remember what brand to buy. So he also purchases two of the three brands of paint at random. Determine the probability that both the woman and her husband fail to get the correct brand of paint. (*Hint: Are the husband's selections independent of his wife's selections?*)

A) $\frac{3}{2}$

B) $\frac{2}{3}$

C) $\frac{1}{9}$

D) $\frac{3}{4}$

Answer: C

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

93) The college basketball team at West Texas State University has 10 players; 5 are seniors, 2 are juniors, and 3 are sophomores. Two players are randomly selected to serve as captains for the next game. What is the probability that both players selected are seniors?

A) 0.22

B) 0.33

C) 0.50

D) 0.66

Answer: A

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

94) Micron Technology has sales offices located in four cities: Dallas, Seattle, Boston, and Los Angeles. An analysis of the company's accounts receivables reveals the number of overdue invoices by days, as shown here.

Days Overdue	Dallas	Seattle	Boston	Los Angeles
Under 30 days	137	122	198	287
30-60 days	85	46	76	109
61-90 days	33	27	55	48
Over 90 days	18	32	45	66

Assume the invoices are stored and managed from a central database.

What is the probability that a randomly selected invoice from the database is from the Boston sales office?

- A) 0.2702
- B) 0.0231
- C) 0.3461
- D) 0.7765

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

95) Micron Technology has sales offices located in four cities: Dallas, Seattle, Boston, and Los Angeles. An analysis of the company's accounts receivables reveals the number of overdue invoices by days, as shown here.

Days Overdue	Dallas	Seattle	Boston	Los Angeles
Under 30 days	137	122	198	287
30-60 days	85	46	76	109
61-90 days	33	27	55	48
Over 90 days	18	32	45	66

Assume the invoices are stored and managed from a central database.

What is the probability that a randomly selected invoice from the database is between 30 and 90 days overdue?

- A) 0.2702
- B) 0.0231
- C) 0.3461
- D) 0.7765

Answer: C

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

96) Micron Technology has sales offices located in four cities: Dallas, Seattle, Boston, and Los Angeles. An analysis of the company's accounts receivables reveals the number of overdue invoices by days, as shown here.

Days Overdue	Dallas	Seattle	Boston	Los Angeles
Under 30 days	137	122	198	287
30-60 days	85	46	76	109
61-90 days	33	27	55	48
Over 90 days	18	32	45	66

Assume the invoices are stored and managed from a central database.

What is the probability that a randomly selected invoice from the database is over 90 days old and from the Seattle office?

- A) 0.2702
- B) 0.0231
- C) 0.3461
- D) 0.7765

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

97) Micron Technology has sales offices located in four cities: Dallas, Seattle, Boston, and Los Angeles. An analysis of the company's accounts receivables reveals the number of overdue invoices by days, as shown here.

Days Overdue	Dallas	Seattle	Boston	Los Angeles
Under 30 days	137	122	198	287
30-60 days	85	46	76	109
61-90 days	33	27	55	48
Over 90 days	18	32	45	66

Assume the invoices are stored and managed from a central database.

If a randomly selected invoice is from the Los Angeles office, what is the probability that it is 60 or fewer days overdue?

- A) 0.2702
- B) 0.0231
- C) 0.3461
- D) 0.7765

Answer: D

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

98) Three events occur with probabilities $P(E_1) = 0.35$, $P(E_2) = 0.15$, $P(E_3) = 0.40$. If the event B occurs, the probability becomes $P(E_1 | B) = 0.25$, $P(B) = 0.30$. Calculate $P(E_1 \text{ and } B)$.

- A) 0.575
- B) 0.075
- C) 0.021
- D) 0.475

Answer: B

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

99) Three events occur with probabilities $P(E_1) = 0.35$, $P(E_2) = 0.15$, $P(E_3) = 0.40$. If the event B occurs, the probability becomes $P(E_1 | B) = 0.25$, $P(B) = 0.30$. Compute $P(E_1 \text{ or } B)$.

- A) 0.575
- B) 0.075
- C) 0.021
- D) 0.475

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

100) Three events occur with probabilities $P(E_1) = 0.35$, $P(E_2) = 0.15$, $P(E_3) = 0.40$. If the event B occurs, the probability becomes $P(E_1 | B) = 0.25$, $P(B) = 0.30$.

Assume that E_1 , E_2 , and E_3 are independent events. Calculate $P(E_1 \text{ and } E_2 \text{ and } E_3)$.

- A) 0.575
- B) 0.075
- C) 0.021
- D) 0.475

Answer: C

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

101) The URS construction company has submitted two bids, one to build a large hotel in London and the other to build a commercial office building in New York City. The company believes it has a 40% chance of winning the hotel bid and a 25% chance of winning the office building bid. The company also believes that winning the hotel bid is independent of winning the office building bid.

What is the probability the company will win both contracts?

- A) 0.55
- B) 0.44
- C) 0.10
- D) 0.75

Answer: C

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

102) The URS construction company has submitted two bids, one to build a large hotel in London and the other to build a commercial office building in New York City. The company believes it has a 40% chance of winning the hotel bid and a 25% chance of winning the office building bid. The company also believes that winning the hotel bid is independent of winning the office building bid.

What is the probability the company will win at least one contract?

- A) 0.55
- B) 0.45
- C) 0.10
- D) 0.75

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

103) The URS construction company has submitted two bids, one to build a large hotel in London and the other to build a commercial office building in New York City. The company believes it has a 40% chance of winning the hotel bid and a 25% chance of winning the office building bid. The company also believes that winning the hotel bid is independent of winning the office building bid.

What is the probability the company will lose both contracts?

- A) 0.55
- B) 0.45
- C) 0.10
- D) 0.75

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

104) Suppose a quality manager for Dell Computers has collected the following data on the quality status of disk drives by supplier. She inspected a total of 700 disk drives.

<i>Supplier</i>	<i>Drive Status</i>	
	Working	Defective
Company A	120	10
Company B	180	15
Company C	50	5
Company D	300	20

Based on these inspection data, what is the probability of randomly selecting a disk drive from company B?

- A) 0.07
- B) 0.28
- C) 0.021
- D) 0.76

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

105) Suppose a quality manager for Dell Computers has collected the following data on the quality status of disk drives by supplier. She inspected a total of 700 disk drives.

<i>Supplier</i>	<i>Drive Status</i>	
	Working	Defective
Company A	120	10
Company B	180	15
Company C	50	5
Company D	300	20

What is the probability of a defective disk drive being received by the computer company?

- A) 0.07
- B) 0.28
- C) 0.021
- D) 0.76

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

106) Suppose a quality manager for Dell Computers has collected the following data on the quality status of disk drives by supplier. She inspected a total of 700 disk drives.

<i>Supplier</i>	<i>Drive Status</i>	
	Working	Defective
Company A	120	10
Company B	180	15
Company C	50	5
Company D	300	20

What is the probability of a defect given that company B supplied the disk drive?

- A) 0.077
- B) 0.28
- C) 0.021
- D) 0.76

Answer: D

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

107) Men have a reputation for not wanting to ask for directions. A Harris study conducted for Lincoln Mercury indicated that 42% of men and 61% of women would stop and ask for directions. The U.S. Census Bureau's 2012 population estimate was that for individuals 18 or over, 48.2% were men and 51.8% were women. This exercise addresses this age group.

A randomly chosen driver gets lost on a road trip. Determine the probability that the driver is a woman and stops to ask for directions.

- A) 0.518
- B) 0.420
- C) 0.316
- D) 0.390

Answer: C

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

108) Men have a reputation for not wanting to ask for directions. A Harris study conducted for Lincoln Mercury indicated that 42% of men and 61% of women would stop and ask for directions. The U.S. Census Bureau's 2012 population estimate was that for individuals 18 or over, 48.2% were men and 51.8% were women. This exercise addresses this age group.

Calculate the probability that the driver stops to ask for directions.

- A) 0.518
- B) 0.420
- C) 0.316
- D) 0.390

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

109) Men have a reputation for not wanting to ask for directions. A Harris study conducted for Lincoln Mercury indicated that 42% of men and 61% of women would stop and ask for directions. The U.S. Census Bureau's 2012 population estimate was that for individuals 18 or over, 48.2% were men and 51.8% were women. This exercise addresses this age group.

Given that a driver stops to ask for directions, determine the probability that the driver was a man.

- A) 0.518
- B) 0.420
- C) 0.316
- D) 0.390

Answer: D

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

110) A local FedEx/Kinkos has three black-and-white copy machines and two color copiers. Based on historical data, the chances that each black-and-white copier will be down for repairs is 0.10. The color copiers are more of a problem and are down 20% of the time each.

Based on this information, what is the probability that if a customer needs a color copy, both color machines will be down for repairs?

- A) 0.04
- B) 0.96
- C) 0.47
- D) 0.42

Answer: A

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

111) A local FedEx/Kinkos has three black-and-white copy machines and two color copiers. Based on historical data, the chances that each black-and-white copier will be down for repairs is 0.10. The color copiers are more of a problem and are down 20% of the time each.

If a customer wants both a color copy and a black-and-white copy, what is the probability that the necessary machines will be available? (Assume that the color copier can also be used to make a black-and-white copy if needed.)

- A) 0.04
- B) 0.96
- C) 0.47
- D) 0.42

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

112) Hubble Construction Company has submitted a bid on a state government project that is to be funded by the federal government's stimulus money in Arizona. The price of the bid was predetermined in the bid specifications. The contract is to be awarded on the basis of a blind drawing from those who have bid. Five other companies have also submitted bids.

What is the probability of the Hubble Construction Company winning the bid?

- A) 0.2778
- B) 0.1667
- C) 0.6944
- D) 0.0278

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

113) Hubble Construction Company has submitted a bid on a state government project that is to be funded by the federal government's stimulus money in Arizona. The price of the bid was predetermined in the bid specifications. The contract is to be awarded on the basis of a blind drawing from those who have bid. Five other companies have also submitted bids.

Suppose that there are two contracts to be awarded by a blind draw. What is the probability of Hubble winning both contracts? Assume sampling with replacement.

- A) 0.2778
- B) 0.1667
- C) 0.6944
- D) 0.0278

Answer: D

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

114) Drake Marketing and Promotions has randomly surveyed 200 men who watch professional sports. The men were separated according to their educational level (college degree or not) and whether they preferred the NBA or the National Football League (NFL). The results of the survey are shown:

Sports Preference	College Degree	No College Degree
NBA	40	55
NFL	10	95

What is the probability that a randomly selected survey participant prefers the NFL?

- A) 0.5250
- B) 0.2000
- C) 0.6050
- D) 0.5880

Answer: A

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

115) Drake Marketing and Promotions has randomly surveyed 200 men who watch professional sports. The men were separated according to their educational level (college degree or not) and whether they preferred the NBA or the National Football League (NFL). The results of the survey are shown:

Sports Preference	College Degree	No College Degree
NBA	40	55
NFL	10	95

What is the probability that a randomly selected survey participant has a college degree and prefers the NBA?

- A) 0.5250
- B) 0.2000
- C) 0.6050
- D) 0.5880

Answer: B

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

116) Drake Marketing and Promotions has randomly surveyed 200 men who watch professional sports. The men were separated according to their educational level (college degree or not) and whether they preferred the NBA or the National Football League (NFL). The results of the survey are shown:

Sports Preference	College Degree	No College Degree
NBA	40	55
NFL	10	95

Suppose a survey participant is randomly selected and you are told that he has a college degree. What is the probability that this man prefers the NFL?

- A) 0.5250
- B) 0.2000
- C) 0.6050
- D) 0.5880

Answer: B

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

117) Until the summer of 2006, the real estate market in Fresno, California, had been booming, with prices skyrocketing. Recently, a study showed the sales patterns in Fresno for single-family homes. One chart presented in the commission's report is reproduced here. It shows the number of homes sold by price range and number of days the home was on the market.

<i>Price Range (\$000)</i>	<i>Days on the Market</i>		
	1–7	8–30	Over 30
Under \$200	125	15	30
\$200–\$500	200	150	100
\$501–\$1,000	400	525	175
Over \$1,000	125	140	35

Using the relative frequency approach to probability assessment, what is the probability that a house will be on the market more than 7 days?

- A) 0.31
- B) 0.099
- C) 0.58
- D) 0.48

Answer: C

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

118) Vegetables from the summer harvest are currently being processed at Skone and Conners Foods, Inc. The manager has found a case of cans that has not been properly sealed. There are three lines that processed cans of this type, and the manager wants to know which line is most likely to be responsible for this mistake. Provide the manager this information.

Line	Contribution to Total	Proportion Defective
1	0.40	0.05
2	0.35	0.10
3	0.25	0.07

- A) Line 1
- B) Line 2
- C) Line 3
- D) Cannot be determined from this information

Answer: B

Diff: 1

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

119) Parts and Materials for the skis made by the Downhill Adventures Company are supplied by two suppliers. Supplier A's materials make up 30% of what is used, with supplier B providing the rest. Past records indicate that 15% of supplier A's materials are defective and 10% of B's are defective. Since it is impossible to tell which supplier the materials came from once they are in inventory, the manager wants to know which supplier most likely supplied the defective materials the foreman has brought to his attention. Provide the manager this information.

- A) Supplier A
- B) Supplier B
- C) Both are equally likely
- D) Cannot be determined from this information

Answer: B

Diff: 2

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

120) A distributor of outdoor yard lights has four suppliers. This past season she purchased 40% of the lights from Franklin Lighting, 30% from Wilson & Sons, 20% from Evergreen Supply, and the rest from A. L. Scott. In prior years, 3% of Franklin's lights were defective, 6% of the Wilson lights were defective, 2% of Evergreen's were defective, and 8% of the Scott lights were defective. When the lights arrive at the distributor, she puts them in inventory without identifying the supplier. Suppose that a defective light string has been pulled from inventory; what is the probability that it was supplied by Franklin Lighting?

A) 0.33

B) 0.45

C) 0.18

D) 0.29

Answer: D

Diff: 3

Keywords: probability

Section: 4-2 True Rules of Probability

Outcome: 1

121) List three methods of assessing probabilities and indicate which is least likely to be used in business decision making.

Answer: The three methods of probability assessment are classical assessment, relative frequency of occurrence, and subjective assessment. The classical method has very little application for business decision making since rarely are the elementary events equally likely.

Diff: 2

Keywords: classical, relative frequency, subjective, probability assessment

Section: 4-1 The Basics of Probability

Outcome: 1

122) The accountant for a large U.S. company is interested in finding the probability that an account will have an incorrect balance due to being overstated *or* being understated. To find this probability, which probability rule is she likely to use?

Answer: The key word here is *or*, which, in dealing with probability, always means addition. Thus, the addition rule will need to be used.

Diff: 2

Keywords: probability, addition rule

Section: 4-2 True Rules of Probability

Outcome: 2

123) Assume that a standard deck of 52 playing cards is randomly shuffled and the first 2 cards are dealt to you. What is the probability that you have a blackjack? A blackjack is where one card is an ace and the other card is worth 10 points. The 10-point cards are kings, queens, jacks and 10's.

Answer: It doesn't matter which card was first so there are two ways to have a blackjack. One is to get the ace first and the 10-point card second. The other way is to get the cards in the reverse order. There are 4 aces and 16 of the 10-point cards.

$$P(\text{Ace on 1st card}) = 4/52$$

$$P(10 \text{ on 2nd card given that 1st card was Ace}) = 16/51$$

$$\text{So } P(\text{black where Ace is 1st}) = (4/52)(16/51) = 0.0241$$

$$P(10 \text{ on 1st card}) = 16/52$$

$$P(\text{Ace on 2nd card given the first card was a 10}) = 4/51$$

$$\text{So } P(\text{blackjack where Ace is 2nd}) = (16/52)(4/51) = 0.0241$$

The two methods of getting a blackjack are mutually exclusive so these probabilities can be added to find the total probability of a blackjack.

$$P(\text{blackjack}) = 2(0.0241) = 0.0482$$

Diff: 2

Keywords: conditional probability, mutually exclusive

Section: 4-2 True Rules of Probability

Outcome: 2

124) Explain what is meant by the term *mutually exclusive events*. Cite an example.

Answer: Mutually exclusive events exist if the occurrence of one event precludes the occurrence of another event. For example, if a customer is selected at random for a store's master file, if the customer is a female, the same customer cannot also be a male. Thus the events female and male are mutually exclusive.

Diff: 1

Keywords: mutually exclusive, event

Section: 4-2 True Rules of Probability

Outcome: 2

125) Explain why it is possible for two managers to assess different values for the probability that a supplier will fail to deliver a shipment on time.

Answer: Since it is likely that the managers are using subjective probability assessment, their assessments reflect their state of mind about the shipment. They are basing this on any information that they have and their methods of processing the information may be different. Neither assessment can be considered wrong—they simply reflect the thinking of each decision maker. All that is required is that the decision makers process the information in a rational manner.

Diff: 3

Keywords: probability, subjective assessment

Section: 4-1 The Basics of Probability

Outcome: 1