Chapter 4 Probability
Practice 4
STA2023, Broward College

Express the indicated degree of likelihood as a probability value.

1) "There is a 40% chance of rain tomorrow." 1) _____
A) 40 B) 4 C) 0.60 D) 0.40

2) "You cannot determine the exact decimal-number value of π." 2) _____
A) 1 B) 3.14 C) 0.5 D) 0

Answer the question.

3) Which of the following cannot be a probability? 3) _____
A) -1 B) 0 C) $\frac{1}{2}$ D) 1

4) On a multiple choice test with four possible answers (like this question), what is the probability of answering a question correctly if you make a random guess? 4) _____
A) 1 B) $\frac{3}{4}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$

Find the indicated probability.

5) A sample space consists of 154 separate events that are equally likely. What is the probability of each? 5) _____
A) 154 B) $\frac{1}{154}$ C) 0 D) 1

6) A die with 12 sides is rolled. What is the probability of rolling a number less than 11? 6) _____
A) $\frac{5}{6}$ B) $\frac{1}{12}$ C) 10 D) $\frac{11}{12}$

7) Two 6-sided dice are rolled. What is the probability that the sum of the two numbers on the dice will be 3? 7) _____
A) $\frac{1}{2}$ B) $\frac{17}{18}$ C) 2 D) $\frac{1}{18}$

Answer the question, considering an event to be "unusual" if its probability is less than or equal to 0.05.

8) Is it "unusual" to get a 12 when a pair of dice is rolled? 8) _____
A) Yes B) No

9) Is it "unusual" to get 5 when a pair of dice is rolled? 9) _____
A) Yes B) No

From the information provided, create the sample space of possible outcomes.

10) Flip a coin three times. 10) _____
A) HHH HTT HTH TTT HTT THH HHT THT
B) HHH TTT THT HTH HHT TTH HTH
C) HTT THT HTH HHH TTH TTT
D) HHH HHT HTH HTT THH THT TTH TTT

Answer the question.

11) Find the odds against correctly guessing the answer to a multiple choice question with 3 possible answers. 11) _____

A) 3 : 1 B) 2 : 1 C) 3 : 2 D) 2 : 3

12) In a certain town, 25% of people commute to work by bicycle. If a person is selected randomly from the town, what are the odds against selecting someone who commutes by bicycle? 12) _____

A) 1 : 4 B) 1 : 3 C) 3 : 1 D) 3 : 4

Find the indicated complement.

13) Find $P(\overline{A})$, given that P(A) = 0.956. 13) _____

A) 1.956 B) 1.046 C) 0 D) 0.044

14) The probability that Luis will pass his statistics test is 0.67. Find the probability that he will fail his statistics test. 14) _____

A) 0.33 B) 2.03 C) 1.49 D) 0.34

Find the indicated probability.

15) A spinner has equal regions numbered 1 through 15. What is the probability that the spinner will stop on an even number or a multiple of 3? 15) _____

A) $\frac{2}{3}$ B) 12 C) $\frac{7}{9}$ D) $\frac{1}{3}$

16) If you pick a card at random from a well shuffled deck, what is the probability that you get a face card or a spade? 16) _____

A) $\frac{11}{26}$ B) $\frac{9}{26}$ C) $\frac{25}{52}$ D) $\frac{1}{22}$

17) Of the 54 people who answered "yes" to a question, 12 were male. Of the 46 people that answered "no" to the question, 12 were male. If one person is selected at random from the group, what is the probability that the person answered "yes" or was male? 17) _____

A) 0.66 B) 0.24 C) 0.222 D) 0.78

18) The manager of a bank recorded the amount of time each customer spent waiting in line during peak business hours one Monday. The frequency table below summarizes the results. 18) _____

Waiting Time (minutes)	Number of Customers
0-3	11
4-7	14
8-11	12
12-15	8
16-19	4
20-23	3
24-27	2

If we randomly select one of the customers represented in the table, what is the probability that the waiting time is at least 12 minutes or between 8 and 15 minutes?

A) 0.148 B) 0.537 C) 0.685 D) 0.741

19) A 6-sided die is rolled. Find P(3 or 5). 19) _____

A) $\frac{1}{6}$ B) 2 C) $\frac{1}{3}$ D) $\frac{1}{36}$

20) A card is drawn from a well-shuffled deck of 52 cards. Find P(drawing an ace or a 9). 20) _____

A) $\frac{5}{13}$ B) $\frac{13}{2}$ C) $\frac{2}{13}$ D) 10

21) The table below describes the smoking habits of a group of asthma sufferers. 21) _____

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	367	50	65	47	529
Women	316	31	70	45	462
Total	683	81	135	92	991

If one of the 991 people is randomly selected, find the probability of getting a regular or heavy smoker.

A) 0.136 B) 0.493 C) 0.229 D) 0.113

22) A bag contains 8 red marbles, 4 blue marbles, and 1 green marble. Find P(not blue). 22) _____

A) 9 B) $\frac{4}{13}$ C) $\frac{9}{13}$ D) $\frac{13}{9}$

23) In one town, 45% of all voters are Democrats. If two voters are randomly selected for a survey, find the probability that they are both Democrats. Round to the nearest thousandth if necessary. 23) _____

A) 0.900 B) 0.198 C) 0.203 D) 0.450

24) Find the probability of correctly answering the first 5 questions on a multiple choice test if random guesses are made and each question has 4 possible answers. 24) _____

A) $\frac{4}{5}$ B) $\frac{1}{1024}$ C) $\frac{1}{625}$ D) $\frac{5}{4}$

25) A manufacturing process has a 70% yield, meaning that 70% of the products are acceptable and 30% are defective. If three of the products are randomly selected, find the probability that all of them are acceptable. 25) _____

A) 0.027 B) 2.1 C) 0.343 D) 0.429

26) You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that both cards are black. Express your answer as a simplified fraction. 26) _____

A) $\frac{1}{2,652}$ B) $\frac{13}{51}$ C) $\frac{25}{51}$ D) $\frac{25}{102}$

27) You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that the first card is a King and the second card is a queen. Express your answer as a simplified fraction. 27) _____

A) $\frac{1}{663}$ B) $\frac{13}{102}$ C) $\frac{4}{663}$ D) $\frac{2}{13}$

28) What is the probability that 4 randomly selected people all have different birthdays? Round to four decimal places. 28) _____

A) 0.9729 B) 0.9918 C) 0.9891 D) 0.9836

29) The table below describes the smoking habits of a group of asthma sufferers. 29) _____

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	303	35	37	375
Women	413	31	45	489
Total	716	66	82	864

If two different people are randomly selected from the 864 subjects, find the probability that they are both heavy smokers. Round to six decimal places.

A) 0.008908 B) 0.001834 C) 0.0001487 D) 0.009007

Find the indicated probability. Round to the nearest thousandth.

30) An unprepared student makes random guesses for the ten true-false questions on a quiz. Find the probability that there is at least one correct answer. 30) _____

A) 0.001 B) 0.900 C) 0.999 D) 0.100

31) A study conducted at a certain college shows that 56% of the school's graduates find a job in their chosen field within a year after graduation. Find the probability that among 6 randomly selected graduates, at least one finds a job in his or her chosen field within a year of graduating. 31) _____

A) 0.167 B) 0.560 C) 0.969 D) 0.993

32) A sample of 4 different calculators is randomly selected from a group containing 14 that are defective and 39 that have no defects. What is the probability that at least one of the calculators is defective? 32) _____

A) 0.707 B) 0.281 C) 0.140 D) 0.719

33) In a batch of 8,000 clock radios 7% are defective. A sample of 5 clock radios is randomly selected without replacement from the 8,000 and tested. The entire batch will be rejected if at least one of those tested is defective. What is the probability that the entire batch will be rejected? 33) _____

A) 0.304 B) 0.0700 C) 0.200 D) 0.696

Find the indicated probability. Express your answer as a simplified fraction unless otherwise noted.

34) The table below shows the soft drinks preferences of people in three age groups. 34) _____

	cola	root beer	lemon-lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person is over 40 years of age.

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{3}{5}$ D) $\frac{2}{5}$

35) The table below shows the soft drinks preferences of people in three age groups. 35) _____

	cola	root beer	lemon-lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person is over 40 and drinks cola.

A) $\frac{4}{19}$ B) $\frac{4}{17}$

C) $\frac{4}{51}$ D) None of the above is correct.

36) The table below describes the smoking habits of a group of asthma sufferers. 36) _____

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	358	71	69	498
Women	304	78	76	458
Total	662	149	145	956

If one of the 956 subjects is randomly selected, find the probability that the person chosen is a nonsmoker given that it is a woman. Round to the nearest thousandth.

A) 0.459 B) 0.318 C) 0.664 D) 0.379

Solve the problem.

37) There are 10 members on a board of directors. If they must form a subcommittee of 4 members, how many different subcommittees are possible? 37) _____

A) 24 B) 10,000 C) 210 D) 5040

38) The library is to be given 5 books as a gift. The books will be selected from a list of 20 titles. If each book selected must have a different title, how many possible selections are there? 38) _____

A) 1,860,480 B) 15,504 C) 100 D) 3,200,000

39) How many ways can an IRS auditor select 6 of 13 tax returns for an audit? 39) _____

A) 1,235,520 B) 720 C) 1716 D) 4,826,809

40) A state lottery involves the random selection of six different numbers between 1 and 26. If you select one six number combination, what is the probability that it will be the winning combination? 40) _____

A) $\frac{1}{230,230}$ B) $\frac{1}{720}$ C) $\frac{1}{308,915,776}$ D) $\frac{1}{165,765,600}$

41) There are 10 members on a board of directors. If they must form a subcommittee of 6 members, how many different subcommittees are possible? 41) _____

A) 210 B) 720 C) 1,000,000 D) 151,200

42) The library is to be given 3 books as a gift. The books will be selected from a list of 16 titles. If each book selected must have a different title, how many possible selections are there? 42) _____

A) 560 B) 3360 C) 4096 D) 48

43) How many ways can an IRS auditor select 3 of 13 tax returns for an audit? 43) _____

A) 6 B) 1716 C) 286 D) 2197

44) A state lottery involves the random selection of six different numbers between 1 and 31. If you select one six number combination, what is the probability that it will be the winning combination? 44) _____

A) $\frac{1}{887,503,681}$ B) $\frac{1}{530,122,320}$ C) $\frac{1}{736,281}$ D) $\frac{1}{720}$

45) How many 3-digit numbers can be formed using the digits 1, 2, 3, 4, 5, 6, 7 if repetition of digits is not allowed? 45) _____

A) 5 B) 343 C) 6 D) 210

46) How many ways can 6 people be chosen and arranged in a straight line if there are 8 people to choose from? 46) _____

A) 48 B) 20,160 C) 720 D) 40,320

47) A musician plans to perform 4 selections. In how many ways can she arrange the musical selections? 47) _____

A) 4 B) 24 C) 120 D) 16

48) A pollster wants to minimize the effect the order of the questions has on a person's response to a survey. How many different surveys are required to cover all possible arrangements if there are 6 questions on the survey? 48) _____

A) 120 B) 36 C) 720 D) 6

49) There are 9 members on a board of directors. If they must elect a chairperson, a secretary, and a treasurer, how many different slates of candidates are possible? 49) _____

A) 729 B) 84 C) 504 D) 362,880

50) A tourist in France wants to visit 7 different cities. If the route is randomly selected, what is the probability that she will visit the cities in alphabetical order? 50) _____

A) $\frac{1}{5040}$ B) 5040 C) $\frac{1}{7}$ D) $\frac{1}{49}$

51) In a certain lottery, five different numbers between 1 and 21 inclusive are drawn. These are the winning numbers. To win the lottery, a person must select the correct 5 numbers in the same order in which they were drawn. What is the probability of winning? 51) _____

A) $\frac{1}{120}$ B) $\frac{1}{21!}$ C) $\frac{1}{2,441,880}$ D) $\frac{120}{2,441,880}$

52) A class has 11 students who are to be assigned seating by lot. What is the probability that the students will be arranged in order from shortest to tallest? (Assume that no two students are the same height.) 52) _____

A) 0.00000025 B) 0.1000 C) 0.00000028 D) 0.00000003