

Chapter 4 Worksheet

Math 160

Name _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Section 4.2

Estimate the probability of the event.

- 1) Of 1936 people who came into a blood bank to give blood, 200 people had high blood pressure. Estimate the probability that the next person who comes in to give blood will have high blood pressure. 1) _____

Find the indicated probability.

- 2) A bag contains 2 red marbles, 3 blue marbles, and 7 green marbles. If a marble is randomly selected from the bag, what is the probability that it is blue? 2) _____

- 3) In a certain class of students, there are 10 boys from Wilmette, 6 girls from Kenilworth, 6 girls from Wilmette, 5 boys from Glencoe, 3 boys from Kenilworth and 5 girls from Glencoe. If the teacher calls upon a student to answer a question, what is the probability that the student will be from Kenilworth? 3) _____

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

- 4) Is it "unusual" to get a 12 when a pair of dice is rolled? 4) _____
- 5) Assume that a study of 300 randomly selected school bus routes showed that 280 arrived on time. Is it "unusual" for a school bus to arrive late? 5) _____

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

- 6) Flip a coin three times. 6) _____

Section 4.3

Determine whether the events are disjoint.

- 7) Draw one ball colored red from a bag. _____
Draw one ball colored blue from the same bag.
- 8) Meet a man with an umbrella. _____
Meet a man with a raincoat.
- 9) Find a ten dollar bill on the sidewalk. _____
Find a ten dollar bill on the grass.

Find the indicated complement.

- 10) Find $P(\bar{A})$, given that $P(A) = 0.732$. _____
- 11) Based on meteorological records, the probability that it will snow in a certain town on January 1st is 0.185. Find the probability that in a given year it will not snow on January 1st in that town. _____
- 12) If a person is randomly selected, find the probability that his or her birthday is not in May. Ignore leap years. _____

Find the indicated probability.

- 13) A spinner has equal regions numbered 1 through 21. What is the probability that the spinner will stop on an even number or a multiple of 3? _____
- 14) The table below describes the smoking habits of a group of asthma sufferers. _____

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	389	36	83	37	545
Women	419	36	89	35	579
Total	808	72	172	72	1124

If one of the 1124 people is randomly selected, find the probability that the person is a man or a heavy smoker.

15) 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? 15) _____

16) A 6-sided die is rolled. Find $P(3 \text{ or } 5)$. 16) _____

17) A card is drawn from a well-shuffled deck of 52 cards. Find $P(\text{drawing an ace or a 9})$. 17) _____

18) The table below describes the smoking habits of a group of asthma sufferers. 18) _____

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	351	47	70	48	516
Women	395	40	87	43	565
Total	746	87	157	91	1081

If one of the 1081 people is randomly selected, find the probability of getting a regular or heavy smoker.

Section 4.4

Is Event B dependent or independent of Event A?

19) A: A green ball is drawn from a box with five balls and placed next to the box.
B: A red ball is drawn next and placed next to the green one. 19) _____

20) A: A bird lands on your head.
B: The bird lays an egg. 20) _____

Find the indicated probability.

21) A batch consists of 12 defective coils and 88 good ones. Find the probability of getting two good coils when two coils are randomly selected if the first selection is replaced before the second is made. 21) _____

22) In a homicide case 7 different witnesses picked the same man from a line up. The line up contained 5 men. If the identifications were made by random guesses, find the probability that all 7 witnesses would pick the same person. 22) _____

23) 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. 23) _____

24) What is the probability that 4 randomly selected people all have different birthdays? Round to four decimal places. 24) _____

25) A sample of 4 different calculators is randomly selected from a group containing 49 that are defective and 28 that have no defects. What is the probability that all four of the calculators selected are defective? Round to four decimal places. 25) _____

Section 4.5

Provide a written description of the complement of the given event.

26) Of ten adults, at least one of them has high blood pressure. 26) _____

27) When 100 engines are shipped, all of them are free of defects. 27) _____

Find the indicated probability. Round to the nearest thousandth.

28) 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. 28) _____

29) A sample of 4 different calculators is randomly selected from a group containing 18 that are defective and 37 that have no defects. What is the probability that at least one of the calculators is defective? 29) _____

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

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

30) _____

	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

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

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

B. If one of the 255 subjects is randomly selected, find the probability that the person is over 40 given that they drink root beer.

31) The following table contains data from a study of two airlines which fly to Small Town, USA.

31) _____

	Number of flights which were on time	Number of flights which were late
Podunk Airlines	33	6
Upstate Airlines	43	5

If one of the 87 flights is randomly selected, find the probability that the flight selected is an Upstate Airlines flight given that it was late.

Section 4.6

Evaluate the expression.

32) $4!$

32) _____

33) $\frac{9!}{6!}$

33) _____

34) $10P_5$

34) _____

35) $11C_4$

35) _____

Solve the problem.

- 36) How many ways can the letters in the word "WISCONSIN" be arranged? 36) _____
- 37) How many ways can an IRS auditor select 4 of 12 tax returns for an audit? 37) _____
- 38) 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? 38) _____
- 39) 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? 39) _____
- 40) 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? 40) _____
- 41) A bag contains 9 apples and 7 oranges. If you select 8 pieces of fruit without looking, how many ways can you get exactly 7 apples? 41) _____
- 42) Bob is planning to pack 6 shirts and 4 pairs of pants for a trip. If he has 13 shirts and 7 pairs of pants to choose from, in how many different ways can this be done? 42) _____

43) 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? 43) _____

44) 8 basketball players are to be selected to play in a special game. The players will be selected from a list of 27 players. If the players are selected randomly, what is the probability that the 8 tallest players will be selected? 44) _____

Find the probability (as a decimal rounded to four decimal places).

45) A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability that you have all cherry candies. 45) _____

46) A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability that you have 2 cherry candies and 1 lemon candy. 46) _____

47) A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. What is the probability that you have at least 1 lemon candy? 47) _____

Answer Key

Testname: CH_4_WKSHT

- 1) 0.103
- 2) $\frac{1}{4}$
- 3) 0.257
- 4) Yes
- 5) No
- 6) HHH HHT HTH HTT THH THT TTH TTT
- 7) Yes
- 8) No
- 9) No
- 10) 0.268
- 11) 0.815
- 12) $\frac{334}{365}$
- 13) $\frac{2}{3}$
- 14) 0.516
- 15) $\frac{11}{26}$
- 16) $\frac{1}{3}$
- 17) $\frac{2}{13}$
- 18) 0.229
- 19) Dependent
- 20) Independent
- 21) 0.7744
- 22) 0.000064
- 23) $\frac{25}{102}$
- 24) 0.9836
- 25) 0.1566
- 26) None of the adults have high blood pressure.
- 27) At least one of the engines is defective.
- 28) 0.999
- 29) 0.806
- 30) $\frac{1}{3}$
- 31) $\frac{5}{11}$
- 32) 24
- 33) 504
- 34) 30,240
- 35) 330
- 36) 45,360
- 37) 495
- 38) 210
- 39) 720

Answer Key

Testname: CH_4_WKSHT

40) 504

41) 252

42) 60,060

43) $\frac{1}{5040}$

44) $\frac{1}{2,220,075}$

45) 0.1212

46) 0.1818

47) 0.4909